Ebola

General Information

Ebola virus disease (EVD) or Ebola hemorrhagic fever (Ebola HF) is a disease caused by the Ebola Virus, an enveloped virus. It is a severe, and often fatal, disease in humans and non-human primates, such as monkeys, gorillas and chimpanzees.

The first *Ebola virus* species was discovered in 1976, near the Ebola River, where bat hunting is common, and since then, outbreaks have appeared sporadically.

The natural reservoir host of Ebola viruses remains unknown; however, researchers believe that the virus is animal-borne (zoonotic), and that bats are the most likely reservoir.

Source: Google Maps

Source: CDC.gov

Significance

The deadliest Ebola outbreak in recorded history was in Western Africa. An alarming number of people, including several healthcare workers, were infected with the Ebola virus in Liberia, Sierra Leone, and Guinea. The outbreak started in March 2014 and continues at a rapid pace. As of October 8, 2014, there have been nearly 8,400 confirmed cases and over 4,000 deaths, and in some cases, healthcare workers have become infected. Although the outbreak remains contained in Liberia, Sierra Leone, and Guinea, localized cases have been reported in Nigeria, Senegal, Spain and the U.S., and new cases are being reported daily. Close to half of individuals who contracted the virus died.

The Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) have partnered to better understand and manage the public health risks associated with EVD.

Symptoms

When infection occurs, symptoms usually begin abruptly. Symptoms of EVD include fever, severe headache, joint and muscle aches, weakness, diarrhea, vomiting, stomach pain, lack of appetite, and abnormal bleeding. Symptoms may appear anywhere from 2-21 days after exposure to Ebola virus, although 8-10 days is most common.

In approximately half of the patients, the disease becomes severe, causing bleeding. These patients may vomit blood, pass blood through their urine, or bleed under the skin or from their eyes and/or mouth. Death occurs when vessels deep in the body begin leaking fluid, causing a drastic drop in blood pressure which ultimately leads to multi organ (heart, kidneys, liver, and other organs) failure. The fatality rate is estimated from 40-90%.

Transmission

The infection is transmitted by direct contact with blood, body fluids or tissue of infected animals or people. Patients can transmit the virus after showing symptoms and also postmortem. According to infectious disease experts at the WHO and the CDC, the virus is transmitted through direct contact with blood and body fluids of an infected symptomatic person or through direct contact with objects that have been contaminated with infected secretions (i.e. needles). The infection can enter the body through open wounds or mucous membranes such as the mouth, nose or eyes. The virus is also able to survive on contaminated surfaces, so objects contaminated with blood or body fluids such as gloves and needles may be a source of diseases transmission. Ebola is not transmitted through the air, food or water.

In outbreak settings, Ebola virus is typically first spread to humans after contact with infected wildlife and then is spread person-to-person through direct contact with blood and other body

fluids, including sweat, semen and breast milk. The disease can also be spread postmortem, when a person could become infected by touching the body during funeral preparations.

During an outbreak, those at higher risk of infection are health workers, family members and others in close contact with infected and deceased patients. Unfortunately, healthcare personnel are at a high risk for acquiring the infection, especially if the use of PPE (Personal Protective Equipment) is not used correctly.

Treatment

Currently, there are no vaccines or medicines (such as antiviral drugs) that have been proven to work against the Ebola virus. Severely ill patients require intensive supportive care.

This includes maintaining the blood pressure of patients through proper fluid management. Studies showed that a small percentage of people develop immunity to the virus after recovery from an infection with the Ebola virus. Experimental treatments have been tested and proven effective in animal models but have not yet been used in humans.

Prevention

The likelihood of contracting Ebola in North America is considered extremely low unless there is direct exposure to the body fluids of an infected person or handling and eating the meat of infected animals/bats. Ebola in not spread through casual contact; therefore, the risk of an outbreak in North America is very low. The CDC has reinforced that EVD can be controlled through the use of recommended protective measures in clinics and hospitals. Early recognition and identification of patients with potential EVD is critical.

Hospitals have been directed to follow Standard, Contact/Airborne precautions for management of hospitalized patients with known or suspected Ebola virus disease (EVD).

It is advised that if you will be traveling to Africa going to CDC.gov to find out if there are current travel restrictions in place.

Guidelines and Recommendations

Any hospital with suspected patients should follow CDC's Recommendations for Hospitalized Patients with Known or Suspected Ebola Hemorrhagic Fever in Hospitals.
https://www.cdc.gov/vhf/ebola/clinicians/cleaning/hospitals.html

These recommendations include the following as noted below:

As part of the care of PUIs or patients with confirmed EVD, hospitals are recommended to

- **Be sure environmental services staff wear recommended personal protective equipment (PPE)** to protect against direct skin and mucous membrane exposure of cleaning chemicals, contamination, and splashes or spatters during environmental cleaning and disinfection activities. If reusable heavy-duty gloves are used for cleaning and disinfecting, they should be disinfected and kept in the room or anteroom. Be sure staff are instructed in the proper use of PPE including safe removal to prevent contaminating themselves or others in the process, and that contaminated equipment is disposed of appropriately (see question 8).
- **Use a U.S. Environmental Protection Agency (EPA)-registered hospital disinfectant with a label claim for a non-enveloped virus** (norovirus, rotavirus, adenovirus, poliovirus) to disinfect environmental surfaces in rooms of PUIs or patients with confirmed EVD. Although there are no products with specific label claims against the Ebola virus, enveloped viruses such as Ebola are susceptible to a broad range of hospital disinfectants used to disinfect hard, non-porous surfaces. In contrast, nonenveloped viruses are more resistant to disinfectants. As a precaution, selection of a disinfectant product with a higher potency than what is normally required for an enveloped virus is being recommended at this time. EPA-registered hospital disinfectants with label claims against non-enveloped viruses (norovirus, rotavirus, adenovirus, poliovirus) are broadly antiviral and capable of inactivating both enveloped and non-enveloped viruses.
- **Avoid contamination of reusable porous surfaces that cannot be made single use:**
    - Use only a mattress and pillow with plastic or other covering that fluids cannot get through.
    - Do not place PUIs or patients with confirmed EVD in carpeted rooms.
    - Remove all upholstered furniture and decorative curtains from patient rooms before use.
- **Routine cleaning and disinfection of the PPE doffing area.** Routine cleaning of the PPE doffing area should be performed at least once per day and after the doffing of grossly contaminated PPE. Cleaning should be performed by a healthcare worker wearing clean PPE. An EPA-registered hospital disinfectant with label claims against non-enveloped viruses (norovirus, rotavirus, adenovirus, poliovirus) should be used for disinfection. When cleaning and disinfection are complete, the healthcare worker should carefully doff PPE and perform hand hygiene.

To reduce exposure among staff to potentially contaminated textiles (cloth products) while laundering, discard all linens, nonfluid-impermeable pillows or mattresses, and textile privacy curtains into the waste stream and dispose of appropriately.

Although there are few products with specific label claims against the Ebola virus, enveloped viruses such as Ebola are susceptible to a broad range of hospital disinfectants used to disinfect hard, non-porous surfaces. In contrast, non-enveloped viruses are more resistant to disinfectants. As a precaution, selection of a disinfectant product with a higher potency than what is normally required for an enveloped virus is being recommended at this time.

Designated healthcare providers who have received specific training in donning and doffing of PPE for this situation are to perform environmental cleaning and disinfection and to wear recommended PPE (described above) and consider use of additional barriers if needed. Face protection (face shield or facemask with goggles) should be worn when performing tasks such as liquid waste disposal that can generate splashes.

Follow procedures, per hospital policy and manufacturers' instructions, for cleaning and/or disinfection of environmental surfaces, equipment, Disposable textiles, disposable food utensils, dishware and trays should be used and disposed of in Red Bio-medical waste bags.

This includes medical equipment, sharps, linens, used healthcare products such as soiled absorbent pads or dressings, kidney-shaped emesis pans, portable toilets; and used PPE (gowns, masks, gloves, goggles, face shields, respirators, booties, etc.) or byproducts of cleaning contaminated or suspected of being contaminated with a Category A infectious substance.

Arrangements with the Medical waste transporter will need be made. These items are considered a Class A item for the DOT (Department of Transportation – USA)

- **See guidelines related to the disposal of PPE and items used for treatment of the patient.**

Detailed guidelines and recommendations are available at the following links:

WHO:

http://www.who.int/csr/disease/ebola/en/

CDC:

http://www.cdc.gov/vhf/ebola/hcp/infection-prevention-and-control-recommendations.html

http://www.cdc.gov/vhf/ebola/hcp/environmental-infection-control-in-hospitals.html

Health Canada:

http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/ebola-eng.php

Cleaning and Disinfection of Environmental Surfaces

The following disinfectants qualify based on the above CDC and PHAC (Public Health Agency of Canada) recommendations as disinfectant with a label claim for “a non-enveloped- virus.”

Here is a list of Diversey disinfectants that are effective against non-enveloped viruses:

Product	Oxivir®1 RTU / Wipes	Oxivir® Tb RTU / Wipes	Oxivir® Five 16	Avert™ Sporicidal Disinfectant Cleaner/Wipes	Virex® Plus	Virex® Tb	MoonBeam®3 UV Disinfection
Contact Time (Min)	1	1	5	1	5 @ 1:128	3	3
							

Product	Oxivir® Tb RTU / Wipes	Oxivir® Plus (Concentrate)	Virox® 5 Concentrate	Virox® 5 (RTU & Wipes)	Percept (TM/MC) (Concentrate, RTU & Wipes)	Avert™ Disinfectant Cleaner	MoonBeam®3 UV Disinfection
Contact Time (Min)	1	5	5	5	5	1	3
							

Reviewed/Revised: July 10, 2019

References: See guidelines and Recommendations noted in the body of this document