

## OCCUPATIONAL HEALTH & SAFETY ISSUES

### Ebola Virus Disease (EVD)

#### What is it?

Ebola virus disease (formerly known as Ebola hemorrhagic fever) is a severe, often fatal illness, with a death rate of up to 90%. The illness affects humans and nonhuman primates (monkeys, gorillas, and chimpanzees). Ebola, as with other viruses that cause hemorrhagic fevers, have common features: they affect many organs, they damage the blood vessels, they affect the body's ability to regulate itself, and they suppress the immune system.

Ebola first appeared in 1976 in two simultaneous outbreaks, one in a village near the Ebola River in the Democratic Republic of Congo, and the other in a remote area of Sudan.

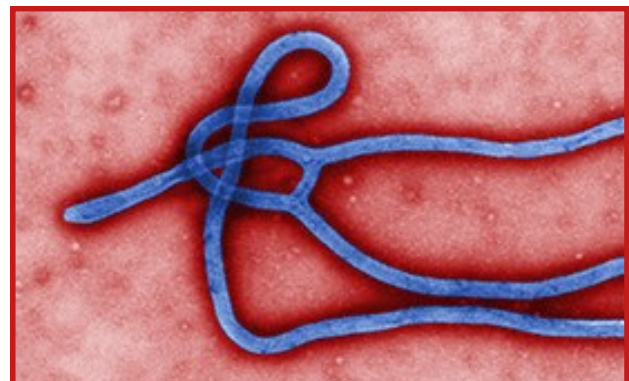
The origin of the virus is unknown but fruit bats are considered the likely host of the Ebola virus, based on available evidence.

Ebola causes severe disease and often death.

#### How do I get infected?

It is believed that the original infections occur from an infected animal to a person. When an infection does occur in humans, there are several ways the virus can be spread to others. These include:

- direct contact with the blood or body fluids (including but not limited to feces, saliva, urine, vomit, tears, nasal secretions and semen) of a person who is sick with Ebola
- contact with objects (like needles, syringes, bedding, clothing and used PPE) or surfaces that have been contaminated with the blood or body fluids of an infected person or with infected animals.



The virus in the blood and body fluids can enter another person's body through broken skin or unprotected mucous membranes in, for example, the eyes, nose, or mouth. Also, through hand contamination that then contacts the eyes, mouth or any mucous membrane surface.

A person with Ebola Virus Disease is communicable as long as the virus remains in the bodily fluids. It has been found in semen up to seven weeks after recovery from infection.

*Persons are not infectious prior to the onset of symptoms.* Transmission of Ebola virus from an asymptomatic person during the incubation period has not been reported. Household transmission is associated with direct care of an ill individual through contact with their bodily fluids, including after death.

## **Who is at risk?**

During an outbreak, those at higher risk of infection are:

- first responders, paramedics, and ambulance staff;
- health care workers;
- people that come into direct contact with the public;
- family members or others in close contact with infected people;
- mourners who have direct contact with the bodies of the deceased as part of burial ceremonies.

More research is needed to understand if some groups, such as immuno-compromised people or those with other underlying health conditions, are more susceptible than others to contracting the virus.

Exposure to the virus can be controlled through the use of protective measures in clinics and hospitals, at community gatherings, or at home.

## **Signs and Symptoms?**

A person infected with Ebola is not contagious until symptoms appear.

Signs and Symptoms of Ebola typically include:

- Fever (greater than 38.6°C or 101.5°F)
- Severe headache
- Muscle pain
- Vomiting
- Diarrhea
- Stomach pain
- Unexplained bleeding or bruising.

Symptoms may appear anywhere from 2 to 21 days after exposure to Ebola but the average is 8 to 10 days.

Recovery from Ebola depends on the patient's immune response. People who recover from Ebola infection develop antibodies that last for at least 10 years.

Laboratory findings include low white blood cell and platelet counts and elevated liver enzymes.

## **How is it confirmed as an Ebola Virus Disease?**

It can be difficult to distinguish EVD from other infectious diseases such as malaria, typhoid fever and meningitis. Confirmation that symptoms are caused by Ebola virus infection are made using the following investigations:

- antibody-capture enzyme-linked immunosorbent assay (ELISA)

- antigen-capture detection tests
- serum neutralization test
- reverse transcriptase polymerase chain reaction (RT-PCR) assay
- electron microscopy
- virus isolation by cell culture.

**Samples from patients are an extreme biohazard risk; laboratory testing on non-inactivated samples should be conducted under maximum biological containment conditions.**

## **What is the Treatment for EVD?**

Currently there are no specific vaccines or medicines (such as antiviral drug) that have been proven to be effective against Ebola. Symptoms of Ebola are treated as they appear. The following basic interventions, when used early, can significantly improve the chances of survival:

- Providing intravenous (IV) fluids and balancing electrolytes (body salts)
- Maintaining oxygen status and blood pressure
- Treating other infections if they occur.

Timely treatment of Ebola is important but challenging since the disease is difficult to diagnose clinically in the early stages of infection. Because early symptoms such as headache and fever are not specific to Ebola viruses, cases of Ebola may be initially misdiagnosed. However, if a person has symptoms of Ebola and had contact with blood or body fluids of a person sick with Ebola, contact with objects that have been contaminated with blood or body fluids of a person sick with Ebola, or contact with an infected animal, the patient should be isolated and public health professionals notified. Supportive therapy can continue with proper protective clothing/equipment until samples from the patient are tested to confirm infection.

## **How do you control and prevent further infections?**

Good outbreak control relies on applying a package of interventions, namely case management, surveillance and contact tracing, a good laboratory service, safe burials and social mobilisation. Community engagement is key to successfully controlling outbreaks. Raising awareness of risk factors for Ebola infection and protective measures that individuals can take is an effective way to reduce human transmission. Risk reduction messaging should focus on several factors:

- reducing **the risk of human-to-human transmission** from direct or close contact with people with Ebola symptoms, particularly with their bodily fluids. Gloves and appropriate personal protective equipment should be worn when taking care of ill patients at home. Regular hand washing is required after visiting patients in hospital, as well as after taking care of patients at home.
- **Outbreak containment measures** including safe burial of the dead, identifying people who may have been in contact with someone infected with Ebola, monitoring the health of contacts for 21 days, the importance of separating the healthy from the sick to prevent further spread, the importance of good hygiene and maintaining a clean environment.

When cases of the disease do appear, there is increased risk of transmission within health care settings. Therefore, health care workers must be able to recognize a case of Ebola and be ready to use appropriate infection control measures.

The aim of these techniques is to avoid contact with the blood or body fluids of an infected patient.

Appropriate procedures include:

- isolation of patients with Ebola from contact with unprotected persons;
- wearing of protective clothing (including masks, gloves, impermeable gowns, and goggles or face shields by persons caring for Ebola patients);
- the use of other infection-control measures (such as complete equipment sterilization and routine use of disinfectant);
- avoid touching the bodies of patients who have died from Ebola;
- healthcare workers should also have the capability to request diagnostic tests or prepare samples for shipping and testing elsewhere.

### **What should health care workers in contact with EVD patients do?**

Health care workers who are in contact with EVD patients or working in isolation units need to take special precautions. Stringent infection control procedures must be followed, including the use of isolation rooms with negative pressure and the use of personal protective equipment. They must wear properly fitted N95 masks or powered air purifying respirators (PAPR) which must be kept clean. Face shields and goggles must be worn in direct patient care, high risk areas. Long sleeved impervious gowns must be worn for direct patient care in high risk areas. Gloves must be worn in high risk areas. Whenever PPE is removed it must be decontaminated first and hands must be thoroughly and effectively washed.

Stringent precautions must also be taken for all workers who clean rooms or linens. Rooms and all surfaces should be cleaned with a broad-spectrum disinfectant certified to kill viruses. The product must be properly diluted and used according to recommended precautions.

Employers must provide all health care workers who are or who could be exposed to Ebola virus with effective education and training and personal protective equipment.

All workers have the right to refuse work which is likely to endanger them. Health care workers also have the right to refuse work which is likely to endanger them, with the exception in some provinces such as Ontario, that their refusal does not directly endanger the life, health or safety of another person. Employers have the responsibility to provide stringent infection control procedures, personal protective equipment and education and training for all people in direct contact with EVD patients. Refuse to work unless these are provided.

The joint occupational health and safety committee should be fully involved with issues of strict infection control procedures, the provision and use of PPE, and education and training.

Remember that viral hemorrhagic fevers have an infectious dose of as little 1 - 10 organisms by aerosol in non-human primates studies.

## How do we clean up after Ebola virus contamination, or potential contamination?

It is important to know that the virus can survive on surface for several hours. It has been found that the risk of transmission of the virus is low if recommended infection control guidelines for viral hemorrhagic fevers are followed. Infection control protocols included decontamination of floors with 0.5% bleach daily and decontamination of visibly contaminated surfaces with 0.05% bleach as necessary.

The Public Health Agency of Canada (PHAC) recommendations for cleaning up spills of blood or body fluids suggest flooding the area with a 1:10 dilutions of 5.25% household bleach for 10 minutes for surfaces that can tolerate stronger bleach solutions (e.g., cement, metal). For surfaces that may corrode or discolour, they recommend careful cleaning to remove visible stains followed by contact with a 1:100 dilution of 5.25% household bleach for more than 10 minutes.

## Precautionary Principle?

We learned from Justice Campbell findings with the SARS outbreak that especially in situations such as these, employers need to exercise the “precautionary principle,” i.e. don’t wait for scientific certainty and adopt the highest level of protection until and unless evidence suggests it is safe to scale back.

## Reasonable Precautions Needed?

The Ontario Nurses’ Association found in Ontario’s six “tested hospitals,” there is evidence that one or more of the following gaps in Ebola preparedness applied:

- JHSCs were not consulted in the development of measures, procedures and training.
- Workers weren’t trained or tested.
- Equipment was not available, accessible or deficient.
- Procedures were inadequate.
- One patient wasn’t identified because screening and readiness wasn’t in place where the patient entered the hospital.

The results of an inspection of ambulance services in Ontario found similar unpreparedness.

### The Globe and Mail reported that:

“At the time of this visit, it was learned that workers have not been acquainted by the employer with the hazard related to [Ebola virus disease],” according to the inspection report for Peel Regional Paramedic Services, a copy of which was obtained by The Globe and Mail. “Further, the workers have not been provided training and instruction related to the use, care and limitations [of personal protective equipment], including how to don and safely remove [it.]”

The reports for Toronto and Hamilton, also obtained by The Globe, reflect similar concerns.

Unifor asks that there be:

- **Full training** of first responders and hospital personnel, along with proper protocols and training materials for **Reasonable Precautions** responding to outbreaks.
- Adequate supplies of **Hazmat suits and other personal protective equipment.**

- **Properly equipped isolation rooms** to assure patient, visitor and staff safety.
- **Sufficient staffing** to supplement nurses and other health workers who need to care for patients in isolation.

Further, the key to preparedness for definitely possible, but infrequent exposure to risks/dangers is **regular drills**. Once workers are trained on proper procedures with appropriate equipment, regular drills from point of entry to isolation to discharge are essential so:

- a) inadequate equipment and procedure gaps can be identified and refined in a safe setting.
- b) when a real Ebola risk arises, everyone automatically, confidently and competently kicks into gear safely.

### **Will I lose pay if I'm off work due to quarantine or illness?**

If you are off work due to EVD you have contracted away from work, you qualify under the provisions of your sick plan at work. If you are off work due to EVD you contracted at work, you qualify for workers' compensation benefits.

### Information Sources:

- The Ontario Directive #1 on Ebola:  
[http://www.health.gov.on.ca/en/public/programs/emu/ebola/docs/evd\\_directive\\_1\\_20141017.pdf](http://www.health.gov.on.ca/en/public/programs/emu/ebola/docs/evd_directive_1_20141017.pdf)
- Public Health Agency of Canada; [www.publichealth.gc.ca](http://www.publichealth.gc.ca)
- World Health Organization Ebola virus disease, Fact sheet N°103; Updated September 2014
- Center for Disease Control; National Center for Emerging and Zoonotic Infectious Diseases Division of High-Consequence Pathogens and Pathology (DHCPP). US
- Center for Disease Control: Infection Prevention and Control Recommendations for Hospitalized Patients with Known or Suspected Ebola Virus Disease in U.S. Hospitals
- European Centre for Disease Prevention and Control (ECDC) 2005 – 2014
- Ontario Nurses' Association; [www.ona.org](http://www.ona.org)
- <http://www.theglobeandmail.com/news/national/ambulance-staff-lack-training-equipment-for-ebola-in-gta/article21311307/>