



Cal/OSHA Interim Guidance on Ebola Virus

October 15, 2014

Several countries in West Africa are currently experiencing a serious epidemic of Ebola Viral Disease (EVD), also called Ebola Hemorrhagic Fever (EHF). As of October 8, 2014 (the latest data available), the World Health Organization (WHO) has reported 8400 total cases, 4656 laboratory-confirmed cases, and 4033 deaths. For the latest updates on Ebola activity, please visit the U.S. Centers for Disease Control and Prevention (CDC) <http://www.cdc.gov/vhf/ebola/index.html>. The CDC and WHO have identified health care workers caring for EVD patients to be at increased risk for infection. As of October 5, 2014, over 400 health care workers were identified as suspected or confirmed EVD cases, with over 200 deaths. On October 12, the CDC reported that an employee caring for an EVD patient in Texas had contracted the infection.

Ebola Viral Disease has had a fatality rate in Africa reportedly as high as 50–90 percent in some outbreaks. Individuals with EVD generally have symptoms typical of viral illnesses, including fever, fatigue, muscle pain, headache, and sore throat. The illness progression includes nausea, vomiting, diarrhea, and impaired organ function. In some cases, rash, internal and/or external bleeding, and death may occur. The incubation period, from initial infection to symptoms, is considered to be 2–21 days. The current CDC case definition can be found at: <http://www.cdc.gov/vhf/ebola/hcp/case-definition.html>

To date, there have been three EVD patients diagnosed in the U.S. Five other patients have been brought to the U.S. for treatment. The initial six patients contracted the disease in epidemic areas. However, the recent infection of two health care workers in Texas who were caring for an EVD patient there has heightened concerns regarding transmission in the U.S., particularly regarding protection for health care workers. The CDC has stated that the risk of a widespread EVD outbreak in the U.S. is very low, although it is likely that individual cases may occur, and therefore hospitals and other health care providers should be vigilant in preparing for EVD, including establishing effective screening procedures.

The CDC and the California Department of Public Health (CDPH) have published guidance for a variety of settings, including hospitals, airlines, and laboratories. Much of this information can be found on the [CDPH Ebola Virus webpage](#), which contains links to specific guidance, recommendations, and reporting forms.

Infection Control

The CDC and CDPH have recommended that standard, contact, and droplet precautions be used for suspect and confirmed EVD patients. In a hospital setting, these measures include the following¹:

- Patients should be placed in a single-patient room (containing a private bathroom) with the door closed.
- All persons entering the patient room should wear at least: gloves, gown (fluid resistant or impermeable), eye protection (goggles or face shield), and facemask.

¹ CDPH, Ebola Virus Information Page, <http://cdph.ca.gov/programs/cder/Pages/Ebola.aspx>

- Additional Personal Protective Equipment (PPE), such as double gloving, disposable shoe covers, and leg coverings, might be required when copious amounts of blood vomit, feces, or other body fluids are present in the environment.
- All persons should perform hand hygiene immediately after removal of PPE.
- Phlebotomy, procedures, and laboratory testing should be limited to the minimum necessary for essential diagnostic evaluation and medical care.
- Aerosol-generating procedures (e.g., Bilevel Positive Airway Pressure [BiPAP], bronchoscopy, sputum induction, intubation and extubation, and open suctioning of airways) should be performed in a private room and ideally in an Airborne Infection Isolation Room (AIIR) when feasible. During aerosol-generating procedures, health care personnel (HCP) should wear gloves, a gown, disposable shoe covers, and either a face shield that fully covers the front and sides of the face or goggles. HCP should also wear respiratory protection that is at least as protective as a fit-tested N95 filtering facepiece respirator certified by the National Institute for Occupational Safety and Health (NIOSH) or a respirator that is even more protective (e.g., powered air purifying respirator or elastomeric respirator).

[The links listed on page 5 provide additional guidance for specific settings including laboratories, educational institutions, airlines, and non-hospital decontamination/disinfection.](#)

Protecting Workers

[Federal OSHA](#)² has identified the following types of workers to be at risk for EVD: health care workers caring for a sick individual, airline flight crew, servicing and cargo employees, laboratory workers, mortuary and death care workers, emergency responders, individuals involved in border protection, customs, and quarantine operations, and other workers in other critical sectors who may come into contact with sick individuals or their body fluids.

The [Cal/OSHA Bloodborne Pathogens \(BBP\) Standard](#)³ applies to all workers who have occupational exposure to blood or other potentially infectious materials. This includes health care workers who care for EVD cases and suspected cases, and workers who are otherwise exposed to potentially infectious bodily fluids. This includes housekeeping or other personnel responsible for disinfecting areas occupied by EVD patients. It also applies to laboratory workers. Some important provisions of this standard include:

- Universal precautions to protect against blood and other potentially infectious materials.
- Engineering and work practice controls to minimize employee exposure to blood and other bodily fluids.
- Personal protective equipment, including gloves, impermeable body coverings, and protection for the eyes, nose, and mouth to prevent droplets from contacting mucous membranes. (Contaminated personal protective equipment, including scrubs or uniforms, must be removed on-site and laundered or disposed of by the employer.)
- Appropriate disinfection of the worksite.
- Investigation of exposure incidents and post-exposure follow-up.
- Training on how the disease is spread, protective measures, and what to do in the case of an exposure incident.

² OSHA Ebola webpage, <https://www.osha.gov/SLTC/ebola/hazards.html>

³ California Code of Regulations, title 8, section 5193

In 2009, California adopted the [Aerosol Transmissible Disease \(ATD\) Standard](#),⁴ a regulation that specifically addresses diseases that may be spread through aerosols, including infectious droplets that may contact mucous membranes. Ebola and other viral hemorrhagic fevers are covered by this regulation. This regulation requires droplet and contact precautions for EVD. Based on the CDPH recommendations for workers, this standard also requires the use of respiratory protection at least as effective as a NIOSH-approved N95 respirator for workers who perform, or are exposed to, aerosol-generating procedures. Such procedures include intubation, caring for patients on positive-pressure ventilation (whether continuous or bi-level), and suctioning of the airway.

The ATD standard applies to all health care employees who may treat patients with aerosol transmissible diseases (such as influenza), including all potentially exposed hospital employees and emergency medical services. It also applies to workers in primary care offices and clinics, and most medical specialty offices and clinics, public health workers, public safety employees who are exposed to infectious disease hazards, decontamination workers, and workers in clinical, research, and academic biological laboratories,

The ATD standard requires covered employers to do the following:

- Designate a responsible program administrator.
- Have a written program (or written procedures) to control infectious diseases.
- Update written procedures at least annually and when necessary to deal with new or newly recognized hazards. These plans should be updated now to address EVD.
- Use appropriate screening protocols to identify patients who may be infectious. In the case of EVD, this should include taking a travel history and asking questions about exposure to EVD patients.
- Provide and use feasible engineering controls such as separate rooms, barriers, decontamination facilities, and ventilation systems to reduce exposure.
- Use appropriate respiratory protection.
- Investigate all potential exposures to infectious patients and provide appropriate medical follow-up, which may include paid leave during exclusion from the workplace during a potential incubation period (precautionary removal), if recommended by the local health department or evaluating physician.
- Provide appropriate vaccinations and other medical services such as TB testing.
- Train employees on specific diseases and means of transmission, protective measures in the facility, use of personal protective equipment and respiratory protection, how to report exposures, and medical services that will be provided.

Workers in laboratories working with specimens that may contain Ebola virus are covered by subsection (f) of the ATD Standard. Laboratory employers must have a biosafety officer and a biosafety plan in order to identify, evaluate, and control the risk of transmission. The CDPH has published [packaging and shipping guidelines for Ebola specimens](#).

Persons infected with Ebola may initially contact the health care system through emergency or urgent care departments of hospitals, or may be initially identified through emergency medical services or through primary care settings, including university-based clinics. Employers in these settings must provide screening information, and procedures to follow when employees are presented with patients who may have EVD. CDC guidance for clinicians can be found at <http://www.cdc.gov/vhf/ebola/hcp/clinician-information-us-healthcare-settings.html> and at <http://www.cdc.gov/vhf/ebola/pdf/ebola-algorithm.pdf>

⁴ California Code of Regulations, title 8, section 5199

Respiratory Protection

As stated above, respiratory protection is required when employees are exposed to aerosol-generating procedures. Such protection is also required for decontamination activities that may aerosolize infectious material, such as the use of a water spray. More information on protecting employees during decontamination procedures can be found at https://www.osha.gov/Publications/OSHA_FS-3756.pdf.

Many hospitalized Ebola patients are provided with respiratory support such as oxygen therapy or BiPAP. Because these are aerosol-generating procedures, the employer must ensure that employees entering a room with such a patient use NIOSH-approved respirators. In addition, viral particles may be present in a variety of bodily fluids that may also become aerosolized through coughing, vomiting, or other emissions. Therefore, Cal/OSHA recommends that employers also provide a NIOSH-approved respirator to any employee who has contact with an EVD patient or is otherwise exposed to EVD infectious materials.

Respiratory protection must be used in the context of a respiratory protection program, which includes training of respirator users and medical evaluation. All filtering facepiece respirators, such as N95 respirators and other tight-fitting respirators, must be fit-tested. All respirators must be approved by the NIOSH. Respirator straps, if any, should be worn on the head, not over other PPE or head coverings.

Filtering facepiece respirators used in the context of EVD must be fluid resistant. These respirators will be labelled as “surgical” N95s, indicating that they have been cleared by the Food and Drug Administration (FDA) as well as NIOSH.

Other types of respirators, such as Powered Air Purifying Respirators (PAPRs) or elastomeric (plastic) full-facepiece air purifying respirators may be an appropriate choice for contact with EVD, or for aerosol-generating procedures. PAPRs provide a higher level of respiratory protection, and the cowls and head coverings used in health care also provide eye and face protection, eliminating the need for a separate faceshield, and simplifying the PPE ensemble. PAPRs also decrease the effort of breathing, and may be appropriate not only for patient care but for certain activities, such as environmental decontamination activities of long-duration. Head coverings and cowls may also be used by employees who have facial hair or who otherwise cannot be fit-tested for a tight-fitting respirator. Because PAPRs rely upon a battery to power the fan that draws filtered air into the head covering, cowl, or facepiece, the employer must have an effective maintenance program to keep units on-charge and available.

Whatever respirator is chosen, consideration should be given to the ability to disinfect and/or dispose of the respirator, its compatibility with the rest of the personal protective equipment ensemble, and its suitability for the task. Employees must be given the opportunity to practice wearing the respirator, and must be instructed on how to avoid contaminating the interior of the respirator.

Personal Protective Equipment

Because EVD symptoms may result in significant release of infectious bodily fluids, and because the disease may be spread through contact with those fluids, the appropriate and consistent use of personal protective equipment is important. This equipment should include body coverings that are fluid-resistant or impervious to fluids, for example disposable fluid-resistant suits or gowns, in addition to gloves, eye protection and a faceshield and fluid-resistant respirator or mask. Shoe and leg coverings may also be necessary. The employee’s clothing must be protected from contact with infectious fluids, and if the clothing does become contaminated, the employer must make arrangements to dispose of or launder that clothing. Contaminated clothing should not be taken home to be washed, as it is a potential source of exposure to the employee and other household members.

It is important to follow correct procedures for putting on (donning) or taking off (doffing) protective equipment. The CDC has published a [chart](#) that explains these procedures in general terms. However, the procedures for any given equipment ensemble will depend on the specific equipment. Respiratory protection, if used, must be worn directly on the face and head. Respirator straps should not be placed over any hood or head covering.

The CDC has identified doffing procedures as being particularly critical in protecting workers from EVD. Each PPE ensemble will require specific procedures, but the following recommendations generally apply:

- Determine the processing procedures available for discarded PPE, and choose appropriate containers. Consider the means of decontamination and disposal in choosing the PPE ensemble.
- Designate an area for doffing equipment. This should be separate from the “clean” area where employees don respirators and PPE. Place appropriate containers for equipment that will be disposed of or cleaned.
- Designate employees to assist with the donning and doffing operations.
- Use a disposable or cleanable container (such as a small plastic wading pool with no water in it) for employees to stand in when removing large articles such as disposable gowns, shoe coverings or disposable coveralls. A plastic liner (such as a trash bag) can be placed inside if it does not create a slipping hazard. The goal is to minimize handling of contaminated equipment.
- All employees who will enter the patient room and all employees who will assist in decontamination should participate in practice exercises. These exercises should be reviewed and any problems found corrected.

Cal/OSHA is committed to working closely with CDPH, as well as with employers and employee organizations, to ensure that employees in California are protected against EVD.

For Further Information

[OSHA webpage on Ebola](#)

[CDPH webpage on Ebola](#)

[CDC webpage on Ebola](#)

[NIOSH webpage on Ebola](#)

[CDPH Respirator Use in Health Care](#)