



# Decontamination of buildings contaminated with Ebola virus

## What is the purpose of this document?

This document provides an overview of the most current information available for local, state or private entities to use when the decontamination of buildings is warranted due to Ebola virus disease (EVD). The information in this document is an accumulation of regulatory agencies' recommendations (see **Resources** below). The information in this document does not supersede the information provided by federal and international agencies [Centers for Disease Control and Prevention (CDC), World Health Organization (WHO), etc.].

For local and state-level Ebola-response planning tips, visit the CDC website for its guidance on Ebola preparedness (1). This fact sheet identifies rapidly emerging CDC guidelines for Ebola applicable to the public health preparedness national standards for state and local planning.

For medical facilities seeking guidance for EVD patient handling and care and EVD management in a medical facility, review the healthcare-related documents and websites provided by the CDC (2) and the WHO (3), as well as other agencies' healthcare worker guidance (4).

Most of the response measures outlined in this fact sheet are based upon healthcare guidance. This fact sheet will be updated as regulatory agencies develop updated EVD recommendations. For general information related to EVD transmission, risk factors, and the signs and symptoms of EVD, see the fact sheets developed by the Minnesota Department of Health (MDH) (5), the CDC (6) and the WHO (7).

This fact sheet is intended to help municipal, county, state or private entities understand the aspects associated with a decontamination response for an EVD-contaminated structure and to find the most efficient management method. To do this, four topics are discussed:

- Purpose of decontamination;
- Isolation and security of the area;
- Decontamination of the affected area; and
- Transportation and disposal of Ebola virus-related wastes

### Contents

What is the purpose of this document?.....	1
Purpose of decontamination.....	1
Isolation of the area/Security of waste.....	2
Decontamination considerations.....	2
Transport and disposal considerations.....	3
For more information.....	4
References.....	4

## Purpose of decontamination

If an individual has been confirmed to have EVD, building owners and local and state agencies may wish to decontaminate any buildings that have been potentially impacted by the infectious person. The following provides information on the cleanup of EVD-contaminated buildings. This information is provided based on the assumption that the symptomatic individual has already been evacuated and that no unauthorized persons remain in the area. This fact sheet is not intended to provide guidance for personal/victim decontamination, but to provide guidance for the cleanup/decontamination of contaminated

buildings, such as residential structures, personal vehicles, public transportation, medical facilities, schools, work places, or other businesses.

## **Isolation of the area/Security of waste**

Initial concerns for EVD-contaminated structures include the need to isolate the impacted area. The city/municipality should follow MDH recommendations for isolation of the area of concern. Isolating the area and ensuring the contaminated area remains vacated by all unauthorized persons during all phases of the cleanup helps guarantee public safety. Contact either the MDH or the MPCA for more information regarding the responsibilities of local jurisdictions for maintaining isolation and security for the affected area.

Security of the waste that is being stored or transported is the responsibility of the individuals preparing the waste for transport, under the Hazardous Materials Regulations (HMR) administered by the U.S. Department of Transportation (USDOT) (8). It should be noted that coordination with different entities to provide security may be valuable and can be arranged at the discretion of the individuals managing the incident.

## **Decontamination considerations**

Transmission of Ebola virus can occur through the direct and indirect contact of contaminated items. Items become contaminated through direct contact with blood and/or body fluids of a symptomatic individual or through indirect contact with objects that have been contaminated (6). Because of these transmission risk factors, proper decontamination of an impacted area is necessary to eliminate the potential of a continued spread of the infection. The U.S. Occupational Safety and Health Administration (OSHA) has a fact sheet, *Cleaning and Decontamination of Ebola on Surfaces*, to address precautions that need to be taken during an EVD decontamination response (9). All decontamination procedures must comply with current OSHA standards (10), which includes OSHA's Bloodborne Pathogens standard (29 CFR 1910.1030) (11), OSHA's PPE standard 29 CFR 1910.132 (12), OSHA's Hazard Communication standard 29 CFR 1910.1200, MNOSHA's Right-to-Know standard Minnesota Administrative Rules, Chapter 5206, and, in situations where workers may potentially encounter bioaerosols, the Respiratory Protection standard (29 CFR 1910.134) (14). Note: OSHA's General Duty Clause, [29 U.S.C. §654, 5(a)(1)] (13) requires employers to provide each employee with a place of employment free from recognized hazards that are causing or likely to cause death or serious physical harm.

## **Carefully consider roles and responsibilities in performing the decontamination and removal of contaminated items.**

While some cities/municipalities may have the capability to perform proper decontamination, it is recommended to use a contractor who has the proper training and experience to effectively and safely complete the decontamination. Oversight of all EVD-related decontamination activities will be conducted by the MPCA. Contact the MPCA for help in determining perspective contractors for EVD decontamination or, if desired, your potential role in performing decontamination without contractor involvement. Waste storage and disposal arrangements should be planned and coordinated before the decontamination phase begins.

## **Structural/building decontamination**

Once the area is isolated and no unauthorized individuals can enter the contaminated area, decontamination can begin. While circumstances involving decontamination responses will vary, certain procedures and protocol can be expected for any EVD-related cleanup.

### **a. Proper personal protective equipment (PPE) use by the decontamination team**

The PPE should, at a minimum, correspond with the CDC (15), WHO (16 and 17), and OSHA (18) requirements. Currently, PPE requirements are based upon the CDC and WHO recommendations for healthcare workers. The CDC and the WHO revised their

recommendations on October 20, 2014, and October 31, 2014, respectively (20). Contractors may choose to wear PPE that exceeds the protective qualities of the currently recommended PPE.

**b. Risk-based assessment approach for establishing a decontamination strategy**

Decontamination procedures will vary by case and will be determined in conjunction with the MDH and MPCA. Factors, such as the severity of illness of the symptomatic individual, duration of his or her stay in the building, and the extent of contamination, should be considered when determining the appropriate response for decontamination. The MDH will help determine patient background and the necessary precautions that are anticipated for decontamination of the affected building(s).

**c. Removal and disposal of contaminated items/objects**

Decontamination measures may occur in numerous phases which would include, but are not limited to, disinfection of surfaces and materials (9), removal and disposal of materials (9), and additional disinfection strategies. Removal and incineration of furniture, carpet, bedding, clothing, personal care items, and personal positions may be necessary. Decontamination procedures may vary by case, depending on the actions required to effectively inactivate the virus.

For more information, refer to the CDC guidance document, *U.S. Residence Decontamination for Ebola Virus Disease (Ebola) and Removal of Contaminated Waste* (21).

### **Vehicle decontamination**

If an automobile needs to be decontaminated, the U.S. Army Public Health Command has developed guidance on *Decontamination of Vehicles & Equipment Used for Transportation of Potential Ebola Virus Disease (EVD) Patients or Related Equipment*. This document describes the decontamination process for porous and nonporous surfaces. The guidance is available on the Internet on the U.S. Army Public Health Command website (22).

### **Transport and disposal considerations**

The USDOT regulates Ebola-contaminated materials as a Category A Infectious Substance (23). Special permits from the USDOT are necessary to transport Ebola-contaminated materials; this will be coordinated between the decontamination team and the disposal company. **Do not burn or in any other way dispose of Ebola-contaminated waste at the site without approval from the MPCA.**

Ebola-contaminated wastes are treated at wastewater plants, medical waste incinerators, and autoclave facilities. Wastewater generated from decontamination activities may be discharged to a public wastewater treatment system with the operator's approval. They may impose conditions (3). Discussion and coordination should occur before the start of decontamination. The CDC is in the process of releasing a guidance document for workers in the wastewater sector titled *Interim Guidance for Workers Handling Untreated Sewage from Ebola Cases in the United States*.

Waste from decontamination/cleanup activities should be disposed of in accordance with MPCA guidelines, CDC guidelines (24), U.S. Environmental Protection Agency (USEPA) disinfectants guidelines (25), and the USDOT Hazardous Material Regulations requirements (26). Coordination of the necessary special permits for disposal should occur as early as possible in the decontamination process. The USDOT Pipeline and Hazardous Materials Safety Administration has created a Safety Advisory addressing the necessary packaging and handling procedures for Ebola virus-contaminated infectious waste for transportation to disposal sites (27).

Confirmatory environmental sampling for pre- and/or post-decontamination is not available at this time. The CDC and USEPA have determined that current cleaning standards, including the use of bleach, effectively render the virus inactive (21).

## For more information

Guidance and information collected for this fact sheet was compiled from information published by the MDH, the CDC, the WHO, the Public Health Agency of Canada, and the USDOT. For more information about Ebola, contact the following agencies:

**Minnesota Department of Health, Infectious Disease Epidemiology, Prevention and Control Division**  
Phone 651-201-5414 or 877-676-5414; <http://www.health.state.mn.us>

**Minnesota Department of Labor and Industry, Occupational Safety and Health Administration**  
Phone 651-284-5005 or 877-470-6742; <http://www.dli.mn.gov/mnosha.asp>

**Minnesota Pollution Control Agency**  
Phone 800-657-3864; <http://www.pca.state.mn.us>

**Centers for Disease Control and Prevention**  
Phone 800-CDC-INFO (800-232-4636); <http://www.cdc.gov/vhf/ebola/>

**U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA) Hazardous Materials Information Center**  
Phone 800-467-4922 (9 a.m.-5 p.m. Eastern); <http://phmsa.dot.gov/home>

**World Health Organization**  
<http://www.who.int/csr/disease/ebola/en/>

## References

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