



Disinfection and Disposal of Household Goods Belonging to Patients Infected with Ebola Virus Disease

Technical Information Paper No. 37-032-0918

1. Purpose. This information paper provides guidance for disinfection and disposal of household goods and structures belonging to patients infected with the Ebola Virus Disease (EVD). It is not intended to change any existing Department of Defense directives, policies, or procedures related to normal waste management in on-post housing units.

2. Applicability. This information is applicable to structural interiors and household goods located in housing units on Army installations. Off-post housing units will be subject to local public health authority guidance in the communities adjoining the military installations. This document is not intended to be a step-by-step instruction and should be read in its entirety prior to commencing with any onsite disinfection activities. Contracting officials should ensure that all recommended actions are performed by personnel licensed and trained in the proper use of personal protective equipment (PPE), respiratory protection, hazardous materials management, hazards related to EVD, waste management, and disposal practices.

3. Background. The U.S. Centers for Disease Control and Prevention notes that the 2014 outbreak was the largest outbreak of EVD in history and the first in West Africa. Additional outbreaks in West Africa have occurred in 2017 and 2018. Consequently, a potential exists for Soldiers to contract EVD during response missions in the region and return to their on-post housing units prior to detection of the disease.

4. References. See Appendix A for complete reference information.

5. EVD Transmission.

a. Body fluids and tissue from individuals who develop EVD symptoms are highly infectious. EVD spreads through human-to-human transmission with infection resulting primarily from direct contact (broken skin or mucous membranes) with blood, secretions, organs or other bodily fluids of infected people, and indirect contact with environments contaminated with body fluids. Proper use of PPE when in contact with EVD-infected persons and when handling blood or body fluids and remains of the deceased prevents EVD.

b. Persons in contact with suspected and/or confirmed EVD patients must consistently apply appropriate infection control procedures (standard, contact and droplet precautions). These include basic hand hygiene, respiratory hygiene, and PPE to reduce the risk from splashes or other contact with infected materials, and patient isolation.

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6. Disinfection. There are a number of procedures and materials that can be used to disinfect surfaces suspected of Ebola virus contamination. Not all disinfection methods are suitable for each contaminated material. The porosity of the material and how soiled it is will determine the necessary disinfection measures.

a. Definitions.

(1) Porous materials. These are materials that will allow liquid and gas to pass through them. These vary in hardness, density and porosity. As a result, liquids spilled or applied to porous materials absorb into the material making it difficult to decontaminate. Examples of porous materials include carpet, curtains, cushions and padding, mattresses, paper, pillows, upholstered furniture, and untreated wood.

(2) Non-porous materials. These are materials that will limit or prevent liquid and gas from passing through them. Liquids spilled or applied to these materials will pool or run off the material. Examples of non-porous materials include canned goods, dishes, glasses, metal furniture, plastic items, pots, pans, porcelain sinks and toilets, silverware and sealed/treated wood.

(3) Non-soiled Items. Household goods and personal effects in the home that do not come in contact with persons ill with EVD.

(4) Soiled items. Household goods and personal effects in the home that did come in contact with persons ill with EVD and were contaminated with body fluids. These will require repeated treatments of disinfectant to ensure any dried material, soil deposits, organic materials, and so forth, are sufficiently saturated with disinfectant to neutralize any virus present.

a. Non-Soiled Items. All non-porous items/surfaces in the home will be appropriately disinfected, even items and surfaces that do not appear to be soiled. All porous items in the home that do not appear soiled/contaminated will be laundered or cleaned with appropriate disinfectant. Electronic items will be wiped clean with a suitable disinfectant/sterilization method. Cleaning all surfaces prevents unintended exposures to others living in the household.

b. Items Soiled with Body Fluids. Household goods and personal effects in the home that have been contaminated by persons ill or suspected to be ill with EVD must be disinfected using either a 10:1 bleach solution or a U.S. Environmental Protection Agency (EPA) approved disinfectant suitable for Ebola virus decontamination. The EPA has identified disinfectants on *List L: EPA's Registered Antimicrobial Products Effective Against the Ebola Virus* as acceptable for use against EVD. A large number of these

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are peroxide and acidic/alkaline-based cleaners¹. Items that cannot be properly disinfected will be disposed of according to applicable waste regulations (see Disposal below).

(1) Decision to Retain or Dispose. The Garrison Staff will coordinate with the supporting hospital/clinic Infection Control Team to decide what personal property items and household goods to disinfect and leave in the household and what items to dispose of as EVD waste. Plastic identifications, glassware, countertops, porcelain sinks and toilets, and other non-porous items can be appropriately disinfected in bleach or a suitable EPA approved disinfectant. Porous furniture such as mattresses, upholstered chairs and couches, and carpeting are too big to be effectively laundered and may not be effectively disinfected. Electronics (phones and computers) may not survive disinfection methods. Personal property and accountability regulations will be referenced. Inventories of personal effects will be recorded and certificates of destruction will be completed. Personnel who complete the inventories must be trained and wear appropriate PPE to handle items potentially contaminated with the EVD.

(2) Non-porous Household Items. All non-porous items/surfaces in the home will be wiped down/cleaned using specified disinfectants. Those items will then be classified as noninfectious and can be retained by the residents of the home.

(3) Porous Household Items. Porous items in the household should be evaluated and separated into contaminated and non-contaminated categories. Those items that were not soiled/contaminated by the ill person should be cleaned with appropriate disinfectants or cleaning methods (laundering linens, steam cleaning carpet, etc.) and returned to use in the household. Porous items that were contaminated must be managed for Disposal (see Disposal below) unless a suitable disinfection method exists and is approved by the Medical Authority in charge of the site.

c. Technical Information Papers. The APHC has published two Technical Information Papers that provide disinfection and cleaning information for reference: 1) Decontamination of Equipment Used in the Area of Operations (AO) Impacted by Ebola Virus Disease that addresses disinfection of equipment and 2) Terminal Cleaning for Ebola Virus Disease Contaminated Patient-Care Areas that addresses disinfection of the patient care area and equipment used. See the APHC EVD website for this reference at: <https://phc.amedd.army.mil/topics/discond/diseases/Pages/Ebola-Virus-Disease.aspx>.

7. Use of Professional Support. The potential to contract EVD through contact with items contaminated with infectious body fluids is very high. Disinfection should be performed by personnel trained and experienced in biological waste clean-up. There are commercial companies specializing in crime and trauma scene clean-up that have required training and experience. Healthcare facilities and Department of Public Works

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should work with contracting to identify and research companies available in the local area in advance.

a. Guidance for Commercial Cleaning Contracts. Contracts for household cleanup should include the following information/requirements.

(1) The Contractor shall provide all State required permits for treatment and transport.

(2) A Site Safety and Health Plan will be developed detailing what PPE will be used, procedures for disinfection (porous and non-porous), treatment of infectious waste prior to transport off site as regulated medical waste (RMW), and how and where waste will be disposed.

(3) Contractor will be authorized to conduct official personal effects and property inventories (utilizing PPE to handle personal effects) and prepare required documentation.

(4) An EPA registered disinfectant identified as suitable for Ebola virus decontamination, or bleach at a 10:1 solution will be used. The EPA has identified a number of disinfectants suitable for EVD decontamination. The disinfectants on *List L: EPA's Registered Antimicrobial Products Effective Against the Ebola Virus* have been identified as being acceptable for use against EVD.

(5) The contractor should treat all infectious EVD waste on site prior to removal from the property in order to meet Department of Transportation (DOT) regulations for transport as RMW. Note: Untreated EVD waste must be transported as a Category A Infectious Substance according to a DOT issued Special Permit (SP). The DOT-SP will specify packaging requirements necessary for transport of untreated EVD waste and only applies to DOT approved transportation applicants. If the contractor chooses not to disinfect a contaminated EVD waste onsite, the EVD waste removal can only be conducted by an approved transporter under the DOT-SP and will only be taken to a treatment facility authorized for EVD waste. This will be expensive and logistically challenging verses disinfection and removal as RMW. A hazardous material shipping paper is required to transport the waste off the property for both untreated EVD waste (shipped as category A infectious substance) and disinfected EVD waste (shipped as RMW).

b. The contractor will clean and disinfect all accessible items/surfaces in the home, even items and surfaces that do not appear to be soiled.

8. Disposal.

a. Contaminated Porous Items. Porous items such as soiled bed linens, mattresses, and couches in direct contact with body fluids from infected patients will be considered infectious Category A EVD waste that is saturated beyond home treatment capabilities. Manage this waste wearing all required PPE for EVD. The best disposal option is to disinfect the items on the property to enable reclassification of the disinfected waste as RMW. Once properly disinfected, the items may be disposed as RMW via a certified RMW transporter. Modern disinfection methods may not reach the interior contamination or may prevent reuse due to saturation in items such as furniture; therefore, reclassification to RMW instead of solid waste prevents infection of the waste treatment personnel through contact with potentially untreated internal components of the items.

b. RMW Transport. Treat items selected for disposal to allow their reclassification as RMW. Select a company that will transport the disinfected items to a licensed RMW treatment and disposal facility (if it is different from the clean-up company) to ensure the company is a state licensed and approved transporter for RMW. Transport treated items off the installation for RMW treatment and disposal.

c. Contaminated Non-porous items should be disinfected and returned to the household.

Prepared by: Waste Management Branch at 410-436-3651 or DSN 584-3651
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Endnote:

¹<https://www.epa.gov/pesticide-registration/list-l-disinfectants-use-against-ebola-virus>

APPENDIX A

REFERENCES

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