



Office of the
Provincial Health Officer

B.C. Guidance on Environmental Management of Potential Ebola Contamination in Community Settings

Provincial Ebola Response Task Force

UPDATED: Feb. 2, 2015



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A. Introduction

This document is to provide guidance to public health authorities and contractors for environmental management in the event a person under investigation¹ for, or a confirmed case² of, Ebola virus disease (EVD) is symptomatic while in the community (home or public space) or primary health care settings (Public Health Agency of Canada, 2014). This document does not address hospital settings.³

Ebola virus is transmitted through direct contact with blood or body fluids of an infected patient with symptoms or through exposure to objects contaminated with infected blood and/or all body fluids. An EVD case is infectious only after they have developed symptoms which include fever, headache, diarrhea and vomiting. Despite limited evidence of the role of the environment or fomites in transmission of Ebola virus, high levels of precaution are recommended to reduce the potential risk of transmission due to the low infectious dose, high viral titres in infected patients as well as the severity of the disease (Centers for Disease Control and Prevention, 2014).

Ebola virus is an enveloped virus which can survive in blood or on wet contaminated surfaces. The duration of survival outside of the body is unknown but it is unlikely to survive for extended periods. One laboratory study suggested survival for up to six days under ideal conditions (Sagripanti, Rom, & Holland, 2010), and another did not find any live virus on environmental samples from a patient care environment under real world conditions in an African hospital (Bausch, et al., 2007). It is sensitive to inactivation by ultraviolet light, drying and broad spectrum virucides used to disinfect hard and non-porous surfaces (Centers for Disease Control and Prevention, 2014).

B. Pre-Event Planning

Health authorities should plan for:

- ▶ Isolating and securing a contaminated space(s) to ensure no people or animals enter it. Securing the space can be done by local law enforcement, security resources or others.
- ▶ Appropriate communications.
- ▶ The use of statutory powers of the *Public Health Act* if non-compliance with public health measures is likely.

¹ Defined as anyone with a potential exposure to the Ebola virus, any symptoms compatible with EVD (Public Health Agency of Canada).

² Defined as anyone with laboratory confirmation of EVD infection.

³ These are addressed in a separate document at: www.health.gov.bc.ca/pho/physician-resources-ebola.html

Quantum Murray, an environmental services company, will be deployed to clean such a site anywhere in the province. They can be reached 24/7 at 1 877 378-7745. The medical health officer should call them to inform them of a possible site to clean as early as possible to allow for preparation time. They will take directions from the medical health officer on when and what to clean, and will bring their own personal protective equipment and decontamination materials. Fraser Health is providing occupational health training to Quantum Murray staff.

Stericycle, an environmental services company, will transport waste collected after the clean-up of a confirmed case to their facility to incinerate or autoclave to make it non-infectious. Arrangements for transport can be made through Quantum Murray. The B.C. contact for Stericycle is Mike MacDougall at 604 835-6287 or MMacDougall@Stericycle.com.

C. Environmental Management

An environment (including fomites) that has been contaminated or potentially contaminated with blood or body fluids from a person under investigation, or confirmed EVD case should be managed immediately as described below:

A. General Principles

- ▶ Isolate and secure the environment (and fomites), which has been contaminated or potentially contaminated with blood and/or all body fluids from a person under investigation or EVD case until EVD is ruled in or out before initiating environmental cleaning.
- ▶ Wear appropriate personal protective equipment (PPE) for low transmission risk settings at a minimum and follow PPE donning and doffing protocols when cleaning the environment of a confirmed EVD case^{4,5}
- ▶ In the event of a confirmed case of EVD, clean and disinfect from low contamination to high contamination areas:
 - All potentially contaminated areas (not visibly soiled) where the EVD case has been after they became symptomatic, including toilets and high touch surfaces such as door handles and telephones.
 - All surfaces and objects which are visibly soiled with body fluids.
 - Discard disposable items (e.g., plastic bags) and items of little or no value (e.g., magazines) if they cannot be cleaned – see “Disposal of Waste” on page 5.
 - Follow waste management protocols described below for a confirmed case.

⁴ Lower transmission risk PPE is described here: www.health.gov.bc.ca/pho/pdf/14-10-29-policy-communique-bc-ebola-virus-disease-ppe-guidelines.pdf

⁵ Donning and doffing procedures for lower transmission risk PPE can be found at: www.health.gov.bc.ca/pho/pdf/ebola-lower-transmission-risk-2014-11-17.pdf

B. Initial Steps

The medical health officer will perform a risk assessment of the likelihood of the person having EVD to help direct the next steps. If the person does not meet the case definition for a person under investigation (PUI), or confirmed EVD case, clean and disinfect as per usual protocol. If the person meets the case definition for a PUI, or confirmed case, continue with subsequent steps.

Where possible, isolate and do not allow family members and public to use areas that are contaminated or potentially contaminated by body fluids **from a PUI or a confirmed EVD cases** (e.g., living space, washrooms, patient examination rooms) until the test results confirm or exclude EVD. If this is difficult to achieve or out of proportion to the amount of contamination or potential contamination (e.g., single exam room in a clinic, a highly used public space, small amount of material), the medical health officer can use discretion to advise otherwise. If EVD is likely, clean as per confirmed case. If EVD is unlikely **and** small amount of contamination/potential contamination, clean as per regular body fluid clean up protocol.

C. Persons under Investigation

- ▶ Isolate and secure the environment that has been contaminated with blood and/or all body fluids until the test results confirm or exclude EVD.
- ▶ Once EVD is ruled out, no further special action is required. Clean and disinfect as per regular protocol.

D. Confirmed Cases

Cleaning and disinfection will be done by Quantum Murray. Transport of waste will be done by Stericycle. Recommendations below are in line with B.C.'s *Recommendations for Environmental Services, Biohazardous Waste Management, and Food and Linen Management for Persons under Investigation, and Confirmed Cases of EVD* and standard operating procedures for cleaning in hospitals.

Supplies:

- ▶ Use a hospital grade disinfectant with a drug identification number and a broad spectrum virucidal claim (Public Health Agency of Canada, 2014)⁶ or a 10% solution of common household bleach in water – one cup bleach in nine cups water (Occupational Health and Safety Administration, 2014). Existing products should be verified for strength and expiry dates. The bleach solution should be freshly made.
- ▶ Use a spill kit, including: paper towels, absorbent granules, dust pan/scoop and plastic bags.
- ▶ Stericycle waste management kits (including red bags, labels and blue drums) are available in each health authority and from Health Shared Services BC. Bags, puncture proof containers and plastic wraps will be needed to collect waste.

⁶ A list of disinfectants for use against Ebola Virus is available on the US Environmental Protection Agency website: www.epa.gov/oppad001/list-l-ebola-virus.html

Site preparation:

- ▶ Set up an anteroom outside the contaminated area. This is a designated clean space where the donning of personal protective equipment (PPE) occurs under the supervision of a trained observer. This is an admission-restricted clean zone. Clean PPE will be stored in this room.
- ▶ Set up a decontamination area right outside the contaminated area. This is a designated space where the doffing of PPE occurs under the supervision of a trained observer. Empty Stericycle drums will be stored here.
- ▶ Set up a locked, restricted, segregated holding area for bins containing waste prior to their transport offsite.

Cleaning and disinfection:

- ▶ For areas with no visible contamination with blood or body fluids, but that may have been contaminated:
 - ▶ Clean and disinfect affected toilets and high touch surfaces such as door handles and telephones using the process outlined below.
- ▶ For areas visibly contaminated with blood and body fluids:
 - ▶ Wear appropriate PPE as previously described.
 - ▶ Allow fluid and droplets to settle.
 - ▶ Put disposable paper towels down to cover the material so it doesn't spread further.
 - ▶ To avoid any splashes and splatter, **do not spray** disinfectant onto spill and **do not use a wet vacuum**.
 - ▶ Over the paper towels, gently apply (do not spray) a disinfectant according to the manufacturer's instructions (use a product with a broad spectrum virucidal claim and a drug identification number).
 - ▶ Allow the product to remain in place to ensure a minimum contact time of 10 minutes or as per manufacturers' instructions.
 - ▶ Pick up the towels and organic material and dispose of as per waste management below.
 - ▶ Disinfect the floor. Start at one end of the affected area and move in one direction until the whole surface has been disinfected. Do not use a circular motion.
 - Ensure adequate ventilation when disinfecting areas with chlorine-based products (i.e., open windows where necessary).

Disposal of waste:

- ▶ Prepare supplies. Drums should be lined with two red bags, which will drape over the edge of the drum. Two zip ties should be included for final tie off. Each red bag must be closed by zip tie independently. Tape them to the edge of the drum, underneath the drape.
- ▶ Not all sites will have blue drums immediately available. Use alternative bags and hard receptacles to contain and store waste in the contaminated area until blue drums are available.

- ▶ Contain all contaminated waste, including linen, clothing, discarded paper towels and personal protective equipment in bags and puncture proof containers (if needed). Discard soiled disposable items (e.g., plastic bags) and soiled items of little or no value (e.g., magazines). Discard soiled items which may have value but cannot be cleaned (e.g., mattress, sofa).
- ▶ For large items that do not fit into containers (e.g., mattresses), wrap in plastic sheeting.
- ▶ The drum should be filled up to $\frac{3}{4}$ full. Waste should not be compacted.
- ▶ Each red bag must be closed by zip tie independently. Place the lid on the drum. The lid does not snap onto the drum. The closure device pulls the lid and drum together to create the seal.
- ▶ Transfer the drums onto a disinfectant soaker pad in the decontamination area.
- ▶ Wipe down the drums and large items wrapped in plastic with the disinfectant. Wait 10 minutes. Repeat.
- ▶ For **Positive Ebola Waste**, once laboratory confirmation has been received as positive for Ebola, infection control will advise environmental services. A “UN 2814” label and an “Incinerate Only” Label must be applied to the blue drum. (These labels are supplied in the Stericycle Kit).
- ▶ For **Negative Ebola Waste**, once laboratory confirmation has been received as negative for Ebola, infection control will advise environmental services. A “UN 3733” label must be attached to the blue drum and the drum is then moved to the regular holding/storage area for all other biohazardous waste.
- ▶ Transfer the waste to a dolly.
- ▶ Workers should doff their personal protective equipment and transport the waste to a locked, restricted, segregated holding area.
- ▶ Stericycle will transport waste under Transport Canada’s Emergency Response Assistance Plans to their facility for incineration (consult Stericycle’s *Procedures for handling and packaging biomedical waste from suspected or confirmed cases of Ebola* for more details).

Wastewater management:

- ▶ There is no evidence to date Ebola is transmitted via sewage systems, with or without wastewater treatment (World Health Organization, 2014). Liquid waste (e.g., urine, stool and emesis) may be disposed of through the normal sanitary sewer system (i.e., toilets) or in accordance with municipal/regional regulations.
- ▶ Some workers⁷ come in contact with untreated sewage before it enters the wastewater treatment plant and could be at very low risk of exposure to Ebola virus. Communications should be planned in the event of an Ebola case and appropriate personal protective equipment should be worn by workers handling untreated sewage from individuals with EVD. Refer to the CDC’s *Interim Guidance for Managers and Workers Handling Untreated Sewage from Individuals with Ebola in the U.S.* at: www.cdc.gov/vhf/ebola/prevention/handling-sewage.html and the corresponding frequently asked questions: www.cdc.gov/vhf/ebola/prevention/faq-untreated-sewage.html.
- ▶ In settings where on-site sewage disposal systems are used (i.e. septic tanks), no specific measures are needed as long as the system is operating adequately. Most septic systems rely on settling and pumping the tank to dispose of the waste.

⁷ These workers include: plumbers in hospitals that are currently treating an Ebola patient; sewer maintenance workers working on the active sewer lines serving the hospital with an Ebola patient; and construction workers who repair/replace active sewer lines serving the hospital with an Ebola patient.

- Contain the wastewater for a period of time⁸ to allow for natural die-off of Ebola virus prior to pumping. This will reduce the concentration of Ebola virus that may be found in wastewater (World Health Organization, 2014).
- If there are concerns about a septic system not operating adequately, consult the medical health officer for further guidance.

References

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⁸ The period of time required is unknown, but is likely a number of days.