

# Interim guidelines for Ebola virus disease environmental cleaning in a community setting

## Aim

To reduce opportunities for community transmission of Ebola virus disease (EVD) via contact with Ebola virus contaminated fomites.

## Purpose

To provide direction for decontaminating environments in the community that may be contaminated with Ebola virus.

## Scope

This guideline deals with the management of blood and/or other body fluid spills and environmental cleaning in community settings, specifically home environments and vehicles (including aircraft) used by a person diagnosed with EVD.

This guideline does not include cleaning of homes where an EVD contact has resided, unless they have tested positive for Ebola virus.

This guideline is to be followed by all Queensland Health staff engaged in facilitating a *final disinfectant clean* of a community setting that may be contaminated with Ebola virus.

## Introduction

People who have been infected with Ebola virus may be in community settings when they first become symptomatic, therefore, there is potential that community settings might be contaminated with Ebola virus prior to the infected person being hospitalised.

The major risk for acquiring an infection among humans is direct contact between a break in the skin, or with mucous membranes and the organs or body fluids from a symptomatic case or an infected animal. These fluids include blood, vomit, diarrhoea, faeces, urine, breast milk, saliva, sweat, tears and semen.

The role of the environment in Ebola virus transmission has not been established, however, Ebola virus has been found to remain viable on solid surfaces (glass, steel, rubber) in the dark for up to six days.<sup>1</sup> Infectivity has been shown to drop by 90 per cent in the first 36 hours.<sup>2</sup>

Experimental exposure of Ebola virus that was dried onto hard surfaces, to UV radiation, demonstrated that the virus is labile and that the majority of the virus can be made inactive. However, a small but significant amount of Ebola virus (3–4 per cent) may remain protected by its environment and may, therefore, be viable.<sup>3 4</sup> Given the low infectious dose required for infection and the severity of the disease, the potential for environmental transmission must be managed. Transmission opportunities increase with the amount of blood or body fluids in the environment.

Ebola virus can be eliminated with heat (60°C for 60 minutes), gamma irradiation, alcohol-based products, and sodium hypochlorite (bleach) or calcium hypochlorite (bleaching powder) at appropriate concentrations.<sup>5</sup> Hydrogen peroxide vapour has been used to decontaminate Ebola virus-exposed rooms, medical equipment and patients' personal items at the U.S. Emory Healthcare Hospital.<sup>6</sup>

## Principles

### Cleaning contractors

Cleaning of environments that may have Ebola virus contamination should be conducted by a cleaning contractor who is competent in decontaminating, handling and discarding infectious agents, and has experience in cleaning biohazards. The contractor(s) must comply with workplace health and safety legislation.

The contract company is responsible for providing a safe system of work, selecting and providing personal protective equipment (PPE) to protect their workers from exposure to the Ebola virus and from chemical hazards due to the cleaning and disinfection agents, and is also responsible for providing workers with proper instruction, training and supervision. This includes:

- safe use of PPE (e.g. not to touch or adjust PPE when working in the contaminated area)
- safe donning and removing of PPE using a methodical sequence, hand hygiene and a trained observer
- how to manage accidental exposure (e.g. accidental contact with blood/body substances, PPE failure)
- maintaining a log of staff who have cleaned the environment and communicate this with the local public health unit.

For access to cleaning contractors contact the Communicable Diseases Unit Ebola Virus Disease Incident Management Team (CDU EVD IMT) on [cduevdimt@health.qld.gov.au](mailto:cduevdimt@health.qld.gov.au) or phone (07) 3328 9753. The CDU EVD IMT has arrangements in place with the Department of Housing and Public Works to access biomedical cleaning contractors.

For the management of environments that may be contaminated with Ebola virus, a trained observer should always be present to support cleaners to don and remove their PPE safely and to monitor their practice to ensure there are no breaches. Trained observers may be supplied by the organisation or arranged by Queensland Health.

### Personal protective equipment

Contractors are to choose one of the following PPE options:

Option 1—gown use:

- disposable P2/N95 respirator
- disposable full-length face shield
- two pairs of disposable non-sterile nitrile long cuff gloves
- disposable long sleeved fluid-resistant or impermeable gown that extends to at least mid-calf
- disposable hood that covers all of the hair and the ears, and extends past the neck to the shoulders
- disposable fluid-resistant or impermeable boot covers that extend to at least mid-calf.

**OR**

Option 2—coverall use:

- disposable P2/N95 respirator
- disposable full-length face shield
- two pairs of disposable non-sterile nitrile long cuff gloves
- disposable coveralls with or without an integrated head covering and with an adhesive flap over the zipper
- disposable hood that covers all of the hair and the ears, and extends past the neck to the shoulders
- disposable fluid-resistant or impermeable boot covers that extend to at least mid-calf.

## Households

Residents of households with a suspected case of EVD should immediately isolate any obvious areas of contamination, including the toilet used by the suspect case. The toilet used by the suspected case should not be flushed prior to the *final disinfectant clean*. Household residents should not use or attempt to clean these areas unless infection of the suspected case with EVD has been excluded.

The CDU EVD IMT will assist in coordinating access to cleaning contractor(s) to do a *final disinfectant clean* of the household if the suspected case tests positive to EVD.

Household members should remain outside the house or make alternative accommodation arrangements until the *final disinfectant clean* is completed.

## Passenger vehicles

A vehicle that has transported a symptomatic person who is suspected of having EVD should be quarantined after all passengers and staff have disembarked, until EVD results are available.

If the case tests positive, a *final disinfectant clean* must be undertaken on all areas in the vehicle that may potentially have been contaminated by the case during travel. The public health unit will take a detailed history from the case on their movements while in transit to determine potentially contaminated areas.

PPE as described in this document should always be used when cleaning vehicles that are potentially contaminated with Ebola virus. Only people who have been trained in the correct use of PPE should undertake a *final disinfectant clean* of vehicle.

## Grossly contaminated items

If items are grossly contaminated (e.g. seats or carpets covered in blood or other body fluids) and difficult to clean properly, they need to be removed and treated as clinical waste. The items should be cleaned and disinfected as much as possible prior to removal to reduce the amount of viable virus.

Persons removing these items (if different to the contracted cleaners) are to be instructed in the safe use of PPE, as outlined in this document, prior to commencing removal. A trained observer should also be on-site to ensure there are no breaches.

## Cleaning process

A contract company that is competent in decontaminating, handling, and discarding infectious agents, and has experience in cleaning biohazards, should be engaged to perform the *final disinfectant clean*. The cleaning process includes both general cleaning and disinfection of the environment, and the cleaning of spills of blood and other body fluids. The contractor(s) must comply with workplace health and safety legislation.

## Blood or other body fluid spills

- Cover the spill with an absorbent material, such as paper towel, if a spill kit is unavailable. Any porous items that are contaminated by the blood or body fluid spill should be discarded as clinical waste.
- Allow a freshly prepared solution containing 5000 ppm sodium hypochlorite solution<sup>7</sup> to soak into the spill for at least 30 minutes. Absorbent sodium hypochlorite granules or gels (5000 ppm) can also be placed directly on the spill, covered with paper towel to limit the spread. This will assist in deactivating any virus or other infectious agents that may be present.

- After 30 minutes, remove the bulk of spilt matter. Tools, such as tongs from a spill kit, should be used as much as possible rather than cleaning and disinfecting directly with gloved hands.<sup>8</sup>
- Discard the absorbent material/paper towels into clinical waste.
- Following the removal of the initial material, the area of contamination should be disinfected again. Cleaning techniques that may result in the generation of splashes and aerosols (e.g. scrubbing, pressurised air or water sprays, hosing) should be avoided.
- Liberally cover the area again with a 5000 ppm sodium hypochlorite solution and soak for 30 minutes before being wiped up.
- Rinse and allow to air dry.
- After cleaning and disinfection work is complete, remove PPE and dispose of as clinical waste. Removal of PPE should be conducted with a trained observer to prevent accidental breaches occurring.
- Discard any unused cleaning chemicals appropriately and dispose of cleaning equipment as clinical waste.
- Wash hands with soap and water, or use an alcohol-based hand rub if no running water is available.

## Final disinfectant clean

- Dry sweeping and dusting with a broom or cloth should not be done. Cleaning should be performed using a damp cloth. Avoid cleaning methods that create splashes and aerosols.
- Use tools, such as tongs from a spill kit, as much as possible rather than doing clean-up work directly with gloved hands.<sup>7</sup>
- Wipes holding dust should be discarded as clinical waste and not be shaken clean.
- Clean horizontal work surfaces and frequently touched surfaces (such as doorknobs, light switches, tap handles, bathroom and kitchen areas) thoroughly with neutral detergent and water using a wipe and then rinse.
- Allow to air dry.
- Clean floor areas with neutral detergent and water, using a mop, and then rinse.
- Allow to air dry.
- Make a fresh 1000 ppm sodium hypochlorite solution in a container for surface cleaning and in a clean bucket for mopping.<sup>8</sup> Do not use disinfectants in spray bottles.<sup>5</sup>
- Disinfect horizontal work surfaces and frequently touched surfaces thoroughly with 1000 ppm sodium hypochlorite solution using a wipe.
- Floors should be disinfected with the sodium hypochlorite solution (1000 ppm) with a clean mop.
- Dispose of all cleaning equipment including buckets, mop handles, mop heads, cloths into the clinical waste after the *final disinfectant clean*.
- Allow the room to air dry.
- After cleaning and disinfection work is complete, remove PPE and dispose of as clinical waste. Removal of PPE should be conducted with a trained observer to prevent accidental breaches. Wash hands with soap and water, or use an alcohol-based hand rub if no running water is available.

## Cleaning the toilet

- Add bleach tablets (Chlortabs™/Chlorclean™) to achieve a 5000 ppm disinfectant strength (i.e. five bleach tablets = 5 x 1000 ppm). Avoid adding 5000 ppm sodium hypochlorite solution to the toilet bowl which increases the risk of splashing/aerosols generation.

- Leave to disinfect for 30 minutes.
- After 30 minutes, ensure the toilet lid is down and flush.
- Aircraft toilets do not require this initial disinfection process as waste is held in a large disinfection tank under the aircraft and pumped into a tanker truck on landing for disposal at a regulated disposal site.
- The toilet's surface and the floor should be cleaned with a 1000 ppm sodium hypochlorite solution after flushing. If the toilet is visibly soiled after flushing, treat the toilet as a spill and disinfect with 5000 ppm sodium hypochlorite solution.

## Storage and disposal of waste

- Porous materials (e.g. linens, carpet, mattress, pillows) should be properly contained and disposed of according to Category A, UN2814, triple-packaged waste as per the [Australian Code for the Transport of Dangerous Goods](http://www.ntc.gov.au) available at [www.ntc.gov.au](http://www.ntc.gov.au). This means using a leak-proof primary bag, which is sealed and then placed inside a leak-proof secondary bag, which is also sealed and then placed in a rigid outer packaging.
- Store the properly contained contaminated material in a room that is not being used until it can be collected for disposal.
- If there have been no spills, the room should be cleaned with neutral detergent and water as per normal cleaning protocols.
- If there has been a spill, clean as per the previous instructions.

## Further information

For further information on developing and implementing safe systems of work to ensure health and safety, including detailed advice on PPE and decontamination, contact the CDU EVD IMT on [cduevdimt@health.qld.gov.au](mailto:cduevdimt@health.qld.gov.au) or phone (07) 3328 9753.

## Review

This guideline will be reviewed as new information and evidence emerges and no later than 1 December 2015.

**Date of last review:** N/A

**Supersedes:** New document

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## Approval and implementation

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## Version control

Version	Date	Prepared by	Comments
1.0	1/12/2014	SHECC EVD IMT	New document

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## References

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- <sup>1</sup> Interim Guidance for Environmental Infection Control in Hospitals for Ebola Virus. <<http://www.cdc.gov/vhf/ebola/hcp/environmental-infection-control-in-hospitals.html>>. Accessed 13 November 2014.
- <sup>2</sup> Sagripanti JL, Rom AM, Holland LE. Persistence in darkness of virulent alphaviruses, Ebola virus, and Lassa virus deposited on solid surfaces. *Arch Virol* 2010; 155:2035-2039.
- <sup>3</sup> Mitchell SW, McCormick JB. Physicochemical inactivation of Lassa, Ebola, and Marburg viruses and effect on clinical laboratory analyses. *J Clin Microbiol.* 1984 Sep;20(3):486-9. Elliott LH, McCormick JB, Johnson KM. Inactivation of Lassa, Marburg, and Ebola viruses by gamma irradiation. *J Clin Microbiol.* 1982 Oct;16(4):704-8.
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- <sup>5</sup> World Health Organization. Interim Infection Prevention and Control Guidance for Care of Patients with Suspected or Confirmed Filovirus Haemorrhagic Fever in Health-Care Settings, with Focus on Ebola. August 2014. <<http://www.who.int/csr/resources/publications/who-ipc-guidance-ebolafinal-09082014.pdf?ua=1>>. Accessed 11 November 2014.
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- <sup>7</sup> Occupational Safety & Health Administration Cleaning and Decontamination of Ebola on Surfaces Fact Sheet <[https://www.osha.gov/Publications/OSHA\\_FS-3756.pdf](https://www.osha.gov/Publications/OSHA_FS-3756.pdf)>. Accessed 11 November 2014.
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