



Office of the  
Provincial Health Officer

# British Columbia Ebola Virus Disease Personal Protective Equipment Guidelines

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Provincial Ebola Response Task Force

UPDATED: June 6, 2016



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The recommendations and information contained in this document are subject to change as new evidence emerges. This document is effective as of **June 6, 2016**.

## Purpose

To communicate British Columbia's standard provincial guideline for the use of personal protective equipment (PPE) in the event of possible or confirmed Ebola virus disease.

## Intended Audience

British Columbia health authorities, regulatory bodies, health care workers, physicians, professional associations and other stakeholders.

## Preamble

While the probability of Ebola virus disease (EVD) in British Columbia is low, preparedness to ensure health care workers can safely and effectively care for patients is essential. Preparedness relies on clear algorithms and clinical processes, appropriate PPE supply and deployment, and appropriate awareness and training for staff in both the processes and equipment.

This document is one of a suite of policies and communiques that relate to EVD. This specific protocol defines the appropriate use of PPE in the event of possible or confirmed EVD. This guideline is aligned with those released by the Public Health Agency of Canada. Supporting training materials for donning and doffing of the recommended PPE have been developed and form part of this overall PPE package.

EVD is transmitted by direct contact of non-intact skin or mucous membranes with blood or body fluids of an infected person, or indirectly through contact with a contaminated environment. Patients infected with Ebola are not considered infectious prior to developing symptoms. These PPE recommendations are based on the known mode of transmission, and reflect the following guiding principles for the management of EVD in British Columbia:

1. Along with the safety and care of patients, health care worker safety is of paramount importance.
2. To prevent the transmission of infection, PPE represents one type of control, along with administrative controls, and environmental/engineering controls. Each type of control is equally important and must act as complementary parts in a system.

3. To reduce the risk of infection, health care workers working with persons under investigation (PUI)<sup>1</sup> or confirmed EVD patients should have no skin exposed.
4. Prior to care of PUI or confirmed EVD patients, health care workers must be trained in infection control procedures, including specific EVD-related donning/doffing procedures.
5. Disposable PPE should be used wherever possible.

## Personal Protective Equipment

The recommendations related to PPE are driven by the level of risk. Following national guidelines, the table on the following pages defines the two risk scenarios and the recommended appropriate PPE.

PPE to be used in aerosol generating medical procedures has been specifically identified as these procedures pose a separate risk from exposure to blood or bodily fluids because of the production of aerosols that may be inhaled. The Public Health Agency of Canada advises that aerosol generating medical procedures should not be performed on suspected or confirmed cases of EVD, but if absolutely necessary (e.g., endotracheal intubation), strategies should be implemented to reduce aerosol generation. More information can be found in Table 1: Quick Reference Table at:

[www.phac-aspc.gc.ca/id-mi/vhf-fvh/ebola-ipc-pci-eng.php](http://www.phac-aspc.gc.ca/id-mi/vhf-fvh/ebola-ipc-pci-eng.php).

Effective preparedness and infection control is dependent upon not only appropriate PPE, but also administrative and engineering controls – each is equally important and must act as complementary parts of a system.

While this guideline is specific to the definition of recommended PPE, further recommendations can be found on the Office of the Provincial Health Officer's website at:

<http://www2.gov.bc.ca/gov/content/health/about-bc-s-health-care-system/office-of-the-provincial-health-officer/current-health-topics/ebola>. These include:

- ▶ Primary Care Guideline for the Management of People Concerned About/Potentially Exposed to Ebola
- ▶ Recommendations for Emergency Departments in Caring for Potential Ebola Virus Disease (EVD) Patients

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<sup>1</sup> A person or patient under investigation for EVD is anyone with a potential exposure to the Ebola virus, any symptoms compatible with EVD (PHAC, 2014).

## Personal Protective Equipment Guidelines:

Risk Scenario	Recommended PPE	Comments
<p><b>Initial presentation – standard ED triage</b></p>	<p>Routine measures for infection control as described by Public Health Agency of Canada for contact and droplet precautions:  <a href="http://publications.gc.ca/collections/collection_2013/aspc-phac/HP40-83-2013-eng.pdf">http://publications.gc.ca/collections/collection_2013/aspc-phac/HP40-83-2013-eng.pdf</a></p>	<ul style="list-style-type: none"> <li>• Supplies for respiratory and hand hygiene and emesis management available.</li> <li>• If possible, a physical barrier (e.g., plastic partition at triage desk) located between infectious sources (e.g., patients with symptoms) and susceptible hosts (i.e., other patients, staff).</li> </ul>
<p><b>Lower Transmission Risk Scenario:</b></p> <p>Includes <b>persons under investigation</b> and <b>confirmed EVD</b> patients without diarrhea and vomiting – patient’s body fluids are contained (usually early stage or convalescing stage of EVD).</p>	<p>Health care worker:</p> <ul style="list-style-type: none"> <li>▶ Gown – fluid-resistant gown (see page 6 for definition of fluid resistant and fluid impermeable)</li> <li>▶ Hoods – fluid-resistant hoods</li> <li>▶ Face shields – full face shield</li> <li>▶ Procedure (surgical) Mask</li> <li>▶ Health care appropriate footwear (as defined by Occupational Health and Safety)</li> <li>▶ Booties – fluid-resistant leg and foot coverings</li> <li>▶ Double Glove – long cuff gloves; first pair under, second pair over gown</li> <li>▶ Additional supplies:             <ul style="list-style-type: none"> <li>○ Alcohol-based hand rub</li> <li>○ Disinfectant wipes</li> <li>○ Absorbent pads</li> </ul> </li> </ul> <p>Patient:</p> <ul style="list-style-type: none"> <li>▶ Mask – procedure/surgical mask</li> </ul>	<ul style="list-style-type: none"> <li>• N95 respirators are not the recommended standard based on evidence, but may be used by health care workers.</li> <li>• Please see below for changes due to anticipated aerosol generated medical procedures.</li> </ul>

Risk Scenario	Recommended PPE	Comments
<p><b>Higher Transmission Risk Scenario:</b></p> <p>Includes <b>persons under investigation</b> or <b>confirmed EVD</b> cases where copious body fluids are contaminating the environment (usually later stages of EVD).</p>	<p>There are two equally effective options provided for the higher transmission risk PPE. The first would be the preferred in terms of ease of use. However B.C., as is the case with most other jurisdictions, is experiencing supply challenges with some components of Option 1. Therefore, until supplies are available, it is recommended that health care workers utilize Option 2.</p> <p><b>Option 1:</b></p> <ul style="list-style-type: none"> <li>▶ Gown/coverall - long-sleeved, cuffed, fluid-impermeable gown (disposable or re-useable), or fluid-impermeable coverall without attached hood (if preferred, and HCW is fully trained in doffing procedure)</li> <li>▶ Hoods – fluid impermeable</li> <li>▶ Face shields – full face shield</li> <li>▶ Respirator – fit tested, N95</li> <li>▶ Dedicated rubber boots</li> <li>▶ Leg coverings/booties – fluid-impermeable; for covering all exposed areas below the gown</li> <li>▶ Double Glove – long cuff gloves; first pair under, second pair over gown</li> <li>▶ Additional supplies: <ul style="list-style-type: none"> <li>○ Alcohol-based hand rub</li> <li>○ Disinfectant wipes</li> <li>○ Shuffle pit with disinfectant fluid</li> <li>○ Absorbent pads</li> </ul> </li> </ul> <p><b>Option 2:</b></p> <p>Hazardous Substance Response Kit</p> <ul style="list-style-type: none"> <li>▶ Scrubs and socks (disposable if available, non-disposable scrubs will be discarded)</li> <li>▶ Dedicated rubber boots</li> <li>▶ Powered Air Respirators (PAPR)</li> <li>▶ Fluid-impervious coveralls</li> <li>▶ Impermeable outer apron (optional)</li> <li>▶ Two pairs of long nitrile gloves (chemical resistant)</li> <li>▶ Additional supplies: <ul style="list-style-type: none"> <li>○ Alcohol-based hand rub</li> <li>○ Disinfectant wipes</li> <li>○ Shuffle pit with disinfectant fluid</li> <li>○ Absorbent pads</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Associated training materials are developed for each scenario. As fluid impermeable coveralls become readily available for Option 1, associated documents will be updated.</li> <li>• Thorough training on effective donning and doffing must be completed.</li> <li>• A trained observer must be engaged.</li> <li>• The health care worker must take care to ensure no skin is exposed.</li> <li>• PPE should be donned prior to entry to the patient room.</li> <li>• Higher transmission risk PPE is complex, and safe use requires that health care workers have been well trained in donning and doffing.</li> </ul>

Risk Scenario	Recommended PPE	Comments
<p><b>Aerosol Generating Medical Procedures (AGMP):</b></p> <p>Aerosol generating medical procedures pose a separate risk from the risk of EVD from exposure to blood or body fluids because of the risk of production of aerosols, which may be inhaled.</p>	<p>AGMP in Lower Risk Transmission Scenario:</p> <ul style="list-style-type: none"> <li>▶ Same PPE as above, with the addition a fit tested N95 respirator <b>must</b> be used.</li> </ul> <p>AGMP in Higher Risk Transmission Scenario:</p> <ul style="list-style-type: none"> <li>▶ No change from the above higher risk transmission PPE.</li> </ul>	

## Canadian Standards Association Definitions

**Fluid resistant:** Material that meets CSA Z314.10.2 Level 1, 2, or 3 or AMMI PB70:12 Level 1, 2, or 3 in terms of its resistance to penetration by liquids and micro-organisms.

- At Level 1, the material meets the requirements of the American Association of Textile Chemists (AATCC) water impact penetration test with a resultant blotter weight gain  $\leq 4.5$  gm. Based on risk of exposure, select fluid-resistant material Level 1 if there are minimal amounts of fluid, minimal fluid spray or splash and minimal pressure on the material.
- At Level 2, the material meets the requirements of the AATCC water impact penetration test with a resultant blotter weight gain  $\leq 1.0$  gm. and the hydrostatic pressure test  $\geq 20$  cm. Based on risk of exposure, select fluid-resistant material Level 2 if there are low amounts of fluid, low fluid spray or splash and low pressure on the material.
- At Level 3, the material meets the requirements of the AATCC water impact penetration test with a resultant blotter weight gain  $\leq 1.0$  gm. and the hydrostatic pressure test  $\geq 50$  cm. Based on risk of exposure, select fluid-resistant material Level 3 if there are moderate amounts of fluid, moderate fluid spray or splash and moderate pressure on the material.

**Fluid Impermeable:** Material that meets Canadian Standards Association (CSA) Z314.10.2 Level 4 or Association for Advancement of Medical Instrumentation (AMMI) PB70:12 Level 4 in terms of its resistance to penetration by liquids and micro-organisms. At Level 4, all the critical components meet the requirements of the American Society for Testing and Materials (ASTM) F1671 bacteriophage penetration test for resistance to penetration by blood-borne pathogens such as hepatitis B, hepatitis C and human immunodeficiency virus. Based on risk of exposure, select fluid-resistant Level 4 (fluid-impermeable) material if there are high amounts of fluid, high fluid spray, or splash and high pressure on the material.