



Office of the
Provincial Health Officer

Recommendations for Reprocessing of Reusable Personal Protective Equipment (PPE) for Ebola Virus Disease: Standard Operating Procedures

Provincial Ebola Expert Working Group
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Introduction

While the probability of a person with 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 clinical processes, appropriate personal protective equipment (PPE) supply and deployment, and appropriate training for staff in the processes and equipment.

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. The Ebola virus is spread through direct contact (via broken skin or mucous membranes of the eyes, nose or mouth) with the blood/body fluids¹ of someone with EVD infection person, or of EVD-blood/body fluid-contaminated items. The risk of transmission increases with the amount of biohazardous material to which the individual is exposed. EVD-associated waste that has been appropriately incinerated or autoclaved is not biohazardous, does not pose a health risk, and is not considered to be regulated medical waste or a hazardous material.

This document lists the standard operating procedures – steps, principles, responsibility and materials required – for reprocessing of two types of reusable PPE, specifically rubber boots and powered air purifying respirator devices used in the care of persons under investigation¹ and confirmed cases² of EVD. This document has been developed by environmental services and infection control experts and should be read in conjunction with the *Recommendations for Environmental Services, Biohazardous Waste Management, and Food and Linen Management for Persons under Investigation and Confirmed Cases of Ebola Virus Disease (EVD)* document.³

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 www2.gov.bc.ca/gov/DownloadAsset?assetId=B488FCB4D75B490AB6B421C06B4E8FB9&filename=standard-operating-procedures.pdf

Standard Operating Procedure – Reprocessing of EVD* Reusable Personal Protective Equipment (PPE)

* Includes equipment used by health care workers in the care of any patient under investigation, or who is a confirmed EVD case.

Principles used:



1. The number of health care workers coming into contact with this PPE should be kept to the minimum.
2. The Ebola virus is spread through direct contact (body fluids including blood, saliva, mucous, vomit, urine, or feces from an infected person have touched the eyes, nose, mouth, or broken skin of another person) or by indirect contact through contaminated items.
3. All health care workers involved in reprocessing of EVD PPE must wear appropriate PPE. The PPE to be worn is the standard used for those who reprocess medical equipment.

Responsibility:

- Part 1: health care workers or doffing assistants (nursing staff)
- Parts 2, and 4: medical device reprocessing technician

Materials needed:


- Designated reprocessing bins with lids
- Two carts for transporting bins to central processing department and returning clean supplies.
- PPE: fluid impermeable gown; fluid impermeable knee-high foot covers; gloves; bouffant cap; procedure mask; full face shield
- Accelerated hydrogen peroxide wipes
- Accelerated hydrogen peroxide solution, with a claim to kill non-enveloped viruses – check manufacturers recommended contact time as this affects soak times in the following instructions. Check expiry date on solution container to ensure proper potency.
- Timer
- Disposable towels




ACTIVITY	STEPS	NOTES
Part 1: Performed by the health care worker doffing his/her PPE, or by the doffing assistant		
Preparation for reprocessing	<ul style="list-style-type: none"> • Wipe outside of each boot with accelerated hydrogen peroxide (AHP) disinfectant wipe. Place boots into designated reprocessing bin. Do not touch inside of boot as this area cannot be cleaned. If there is any question of the inside of boots being contaminated, discard the boots into biohazardous waste drum. • If a disposable breathing tube cover for the powered air purifying respirator (PAPR) is used, remove it by sliding it off and place directly into the biohazardous waste bin. • If a disposable breathing tube cover was not used, discard the breathing tube into the biohazardous waste drum. • If a disposable (cloth) belt was used, using blunt bandage scissors cut off the belt and discard in the biohazardous waste drum (scissors can be wiped down between uses and disposed of in the biohazardous waste bin during the terminal clean). • Remove the filters from the PAPR motor and discard in biohazardous waste drum: VersaFlow has one filter; Breathe Easy has three filters. • Wipe outside of all PAPR equipment with AHP wipes and place into a second designated reprocessing bin. This includes: <ul style="list-style-type: none"> ○ motor/blower unit; ○ battery; ○ breathing tube (unless discarded); ○ belt (unless discarded). • Wipe all outside surfaces of bins with AHP wipes. • Place both bins onto the designated transport cart. • Transport the cart with bins to the area where reprocessing will occur. • Need local process defined for transporting bins. 	<p>Example of large reprocessing bin:</p>  <p>Example of small reprocessing bin:</p> 
Part 2: Prepare for reprocessing (medical device reprocessing technician)		
Don PPE in Designated Clean Area	<ul style="list-style-type: none"> • Don the following PPE: <ul style="list-style-type: none"> ○ Fluid impermeable gown ○ Fluid impervious knee-high shoe covers ○ Gloves ○ Bouffant cap ○ Procedure Mask ○ Full face shield 	<ul style="list-style-type: none"> • PPE is the same as standard use for reprocessing medical equipment. No Ebola specific PPE is required.


Part 3: Reprocess boots and powered air purifying respirator (PAPR)

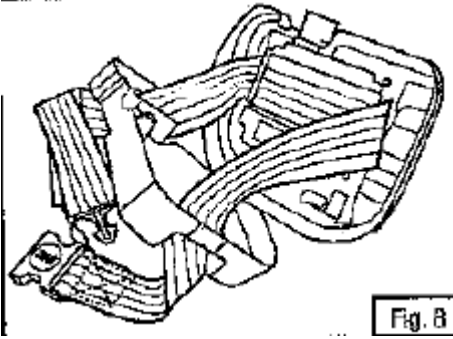
<p>Clean boots</p>	<ul style="list-style-type: none"> • Prepare accelerated hydrogen peroxide (AHP) solution (e.g., Oxivir TB or Accel-Intervention). Check required contact time. • Fill sink with AHP to a depth of two inches, or enough to cover the soles and treads of the boots. • Remove the boots from the reprocessing bin. • Place the boots into the AHP solution, without allowing the inside of the boot to get wet. If there is any question of the inside of boots being contaminated, discard the boots into biohazardous waste bin. • Soak the boots for recommended contact time. • Areas where the boots are not submerged in the AHP solution will be wiped down with the disposable towel soaked in the AHP solution. • After recommended contact time, place the boots on the designated “clean” trolley. • Dry the boots with a new disposable towel. • Wipe down designated reprocessing bin with AHP wipes and/or put through the washer. 	<ul style="list-style-type: none"> • Check required contact time for accelerated hydrogen peroxide (AHP). • AHP soaking solution will be discarded after every use.
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3a) Process for Breathe Easy PAPRs only (see section 3b for Versa Flow procedure)

<p>Disassemble PAPR</p>	<ul style="list-style-type: none"> • Open the bin. Visually check to make sure the three filters have been removed. • If the filters are still present, there are two options: <ol style="list-style-type: none"> a. Replace the lid of the bin, and contact transport team to return bin to the clinical area so filters can be removed and discarded in biohazardous waste bin; or b. Discard the filters in the biohazardous waste drum in the reprocessing area, and notify supervisor to follow up with staff in warm room about correct process. • Remove the PAPR from the designated bin. Detach the breathing tube (if present) from the motor. • Open the motor casing to remove the belt (if present). • When disassembled, it will look like the photo to the right. 	<p>Breathe Easy unit disassembled:</p> 
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<p>Disinfect motor</p>	<ul style="list-style-type: none"> • Disinfect the surface of the <u>motor/blower unit</u> with AHP wipes. Ensure all disinfected surfaces remain wet for at least the recommended contact time. • Disinfect the surface of the <u>battery</u> with AHP wipes. Ensure all disinfected surfaces remain wet for at least the recommended contact time. • DO NOT SUBMERGE. • ENSURE THAT WATER DOES NOT GET INTO THE MOTOR. • Place the motor, casing and battery on the designated “clean” trolley. • Dry with a new disposable towel. 	
<p>Disinfect breathing tube and belt</p>	<ul style="list-style-type: none"> • See photo for the components included in this section: • Fill sink with AHP. Check required contact time. • Breathing tube will soak in AHP in the sink basin for a total of <u>twice the recommended contact time.</u> • Submerge the tube in the AHP and soak for the <u>recommended contact time.</u> • Next rotate the breathing tube 180° and soak again for the <u>recommended contact time.</u> • If reusable belt is present, the belt will be soaked in AHP in the sink basin for the <u>recommended contact time.</u> Make sure the belt stays submerged during this time. 	<ul style="list-style-type: none"> • Check required contact time for AHP. • Photo of components included in this section: 
<p>3b) Process for VersaFlow PAPRS only (see section 3a for Breathe Easy model)</p>		
<p>Disassemble PAPR</p>	<ul style="list-style-type: none"> • Open the bin. Visually ensure that the filter has been removed. • If the filters are still present, there are two options: <ul style="list-style-type: none"> c. Replace the lid of the bin, and contact transport team to return bin to the clinical area so filters can be removed and discarded in biohazardous waste bin; or d. Discard the filters in the biohazardous waste drum in the reprocessing area, and notify supervisor to follow up with staff in warm room about correct process. • Remove the PAPR from the designated bin. Detach the breathing tube (if present) from the motor. • Remove the belt (if present). • When disassembled, it will look like the photo to the right. 	<p>VersaFlow unit disassembled:</p> 

Disinfect motor	<ul style="list-style-type: none"> • Disinfect the surface of the <u>motor/blower unit</u> with AHP wipes. Ensure all disinfected surfaces remain wet for at least the recommended contact time. • Disinfect the surface of the <u>battery</u> with AHP wipes. Ensure all disinfected surfaces remain wet for at least the recommended contact time. • DO NOT SUBMERGE. • ENSURE THAT WATER DOES NOT GET INTO THE MOTOR. • Place the motor, casing and battery on the designated “clean” trolley. • Dry with a new disposable towel. 	
Disinfect breathing tube and belt	<ul style="list-style-type: none"> • See photo for the components included in this section: • Fill sink with AHP. Check contact time. • Breathing tube will soak in AHP in the sink basin for a total of <u>twice the recommended contact time</u>. • Submerge the tube in the AHP and soak in AHP for <u>the recommended contact time</u>. • Next rotate the breathing tube 180° and <u>soak again</u> in AHP for the recommended contact time. • If reusable belt is present the belt will be soaked in AHP in the sink basin for <u>the recommended contact time</u>. Make sure the belt stays submerged during this time. 	<ul style="list-style-type: none"> • Check required contact time for AHP. 
3c) Drying of all components		
Dry breathing tube and belt	<ul style="list-style-type: none"> • Leave the belt on the “clean” trolley to air dry. • There are several ways to dry the breathing tube: <ul style="list-style-type: none"> a. air dry: hang breathing tube vertically to air dry. b. blower: connect breathing tube to the blower and force air through the tube until dry. (Note: If this method is used, make sure to place a disposable towel over the distal end of the tube.) c. dryer: if a dryer is used, the temperature must be below 49° Celsius or 120° Fahrenheit. • When dry, place the breathing tube and belt on the designated “clean” trolley 	

Section 4: Post-Cleaning		
Remove PPE	<ul style="list-style-type: none"> • Call the trained observer prior to removing PPE. • Remove PPE, following instructions of trained observer and checklist, and then exit reprocessing room. 	
Packaging and Labelling	<ul style="list-style-type: none"> • If one room contains separate areas for decontamination and preparation/packaging, again don clean PPE prior to beginning the next steps. • PPE is not required if this step is done in a “clean” separate room. • Assemble and place items into a clear plastic bag. Securely close the bag. • For Breathe Easy, see photo for how to thread belt through motor assembly. • Place a sticker indicating; <ul style="list-style-type: none"> ○ “Disinfected” ○ Date ○ Name of medical device reprocessing technician • Place boots in one clean dry bin and PAPR in a second clean dry bin. • Label outside of bin with “Green means Clean” sticker (if using). 	
Remove PPE if wearing	<ul style="list-style-type: none"> • Engage the trained observer prior to removing PPE. Remove PPE, following instructions of trained observer and checklist, and then exit reprocessing room. 	
Return items to service	<ul style="list-style-type: none"> • When items are ready for restock: <ul style="list-style-type: none"> ○ Local procedure needed for transporting items back to service area 	