

# Viral Hemorrhagic Fever VHF (Ebola) Guidance for Acute Care Settings

Infection Prevention and Control (IPC) & Workplace Health and Safety (WHS)

## Context/background

Viral Hemorrhagic Fever (VHF) are viruses, including Ebola, Lassa and Marburg, transmitted to humans from direct contact (e.g., through broken skin or mucous membranes) with blood, other body fluids and tissues of infected persons or wild animals. It can also be acquired from indirect contact with environmental items contaminated with infected body fluids. In healthcare settings, transmission occurs as a result of close contact with infected patients without appropriate infection control precautions in place. The incubation period ranges from 2 – 21 days (usually 4-12 days). Individuals are not infectious before the onset of fever but communicability increases as the disease progresses. The person remains infectious as long as blood and secretions contain the virus. This includes the post-mortem period.

Although VHF is rare, it has the potential for person-to-person transmission, including healthcare providers (HCPs) not wearing PPE, family members or others who provide care and/or have direct contact with an infected person. **Personnel must take appropriate measures to decrease the risk of transmission by following the IPC guidance below.**

IPC measures included in this guidance are based on currently available scientific evidence and guidelines, and are subject to review and change as new information becomes available.

It should be noted that the PPE worn by HCPs caring for VHF infected patients in affected countries in Africa may appear different than what is recommended in this document. This is because in that difficult setting different PPE may be required due to limited resources (e.g., lack of running water and disposable equipment, and the need to clean and reuse equipment) as compared to what would be expected in a Canadian healthcare facility.

**Notify Zone MOH immediately and Site IPC and WHS** regarding all possible cases (meeting both the Exposure and Clinical Illness Criteria below) for additional assistance.

## Exposure criteria (must be present in conjunction with Clinical Illness Criteria below)

History of one or more of the following within 21 days prior to onset of fever:

- Residence in or travel to any area experiencing an outbreak of VHF
- Contact with a suspect, probable, or confirmed case(s) of VHF
- Direct contact with blood, body fluids, and/or tissues of a person/patient with a confirmed, probable, or suspect case of VHF
- Direct handling of bats, rodents or primates from affected areas
- Work in a laboratory or animal facility handling VHF virus

## Clinical illness criteria

Sudden onset fever – 38.6°C or higher, and at least one of the following:

- Malaise
- Myalgia
- Severe Headache
- Conjunctival injection
- Pharyngitis (sore throat)
- Abdominal pain
- Vomiting, and
- Diarrhea that can be bloody
- Bleeding not related to injury
- Unexplained hemorrhage
- Erythematous maculopapular rash on trunk

## Triage, screening and assessment

- Ensure waiting areas are equipped with:
  - Signs to direct patient with symptoms of acute infection
  - Products for respiratory hygiene (masks, tissues, hand hygiene (HH) products, and no-touch waste receptacles)
  - Immediately triage and place any patient who meets both exposure **and** clinical illness criteria in a single room (with private bathroom).  
Use the [IPC Screening and Rapid Assessment at Presentation to ED/UCC Triage](#)
  - Implement IPC measures including [VHF specific contact and droplet precautions](#) **including meticulous hand hygiene.**
- Keep the room door closed; only essential personnel wearing appropriate PPE to enter
- Keep a log of all persons entering the room
- Laboratory testing for patients suspected to have VHF will only be collected and/or processed after appropriate consultation with the Zone MOH and/or microbiologist/virologist on call. See: <http://www.albertahealthservices.ca/assets/info/hp/diseases/if-hp-dis-2014-08-20-ebola-operational-update.pdf>

The following recommendations are intended as guiding principles and may need to be adapted to suit the staffing model and/or physical environment of the individual facility.

## Triage area preparation

Ensure waiting areas are equipped with:

- Signs to direct patient with symptoms of acute infection

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- Products for respiratory hygiene (masks, tissues, hand hygiene products, and no-touch waste receptacles)
- A physical barrier, such as a plastic partition, or physical separation of 2 m located between the patient and staff.

Healthcare areas that admit, see or register patients (including clinics, inpatient facilities, urgent care centres, or emergency departments) should direct patients who call ahead and indicate they have a fever and have a travel history to a VHF affected area, to an appropriate care setting and initiate necessary IPC measures upon arrival.

### Patients presenting to Health Information Management (HIM) areas

If patients present directly to areas staffed by HIM personnel (such as admitting or registration clerks) and indicate they have a fever and have a travel history to a VHF affected area:

If triage is present on site, the triage nurse should be contacted immediately.

- If the patient requires an escort to triage, any staff member escorting the patient should maintain a distance of 2 m from patient.
- If no escort is required, patient should be instructed to don a procedure mask and perform hand hygiene.
- HIM personnel should perform hand hygiene frequently.

If no triage is present on site, HIM staff should:

- Ensure patient is wearing a procedure mask,
- Maintain a distance of 2 m from patient,
- Immediately contact a site administrative or medical lead and if feasible, escort or direct the patient to a separate room while waiting for a decision to be made.

**The site administrative or medical lead should immediately call the Zone Medical Officer of Health for further direction.**

### Triage recommendations

When a patient presents to triage and meets preliminary criteria for suspect Ebola Virus Disease requiring additional assessment the following recommendations should be followed:

- Maintain a distance of 2 m from patient and not touching the patient.
- Ensure patient is wearing a procedure mask.
- Triage nurse should not examine the patient or ask detailed questions but rather should focus on isolating the patient in the designated space previously determined.
- If the patient must wait for the room to be prepared, the patient should be isolated at the triage area or another area in the ED where access can be controlled.

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- The triage nurse would don PPE based on a point-of-care risk assessment.
- Once the patient is moved to the isolation room, clean the areas in triage that the patient contacted following the AHS recommended guidelines.

### IPC requirements

**Resources:** Many resources can be found on the AHS website. They include:

- [Point of Care Risk Assessment](#)
- [Hand Hygiene](#)
- [Routine Practices](#)
- [PPE Requirements for Suspect/Confirmed Viral Hemorrhagic Fever \(VHF/Ebola\)](#)
- [Airborne Precautions](#) required for Aerosol Generating Medical Procedures (AGMP) which include intubation, open tracheal suctioning, high frequency oscillatory ventilation, CPR, bronchoscopy, trach care, sputum induction, BIPAP and nebulized medication administration. Airborne precautions include the use of a seal-checked and fit-tested N95 respirator by all personnel present in the room during the AGMP. **Avoid AGMP unless considered medically necessary.**
- **PPE:** There are two different sets of PPE donning and doffing sequences included based on risk of potential contamination by blood, body fluids, excretions and secretions. Prior to each patient interaction a [point-of-care risk assessment](#) will be performed. Follow correct donning and doffing procedures, see [PPE Requirements for Suspect/Confirmed Viral Hemorrhagic Fever \(VHF/Ebola\)](#). Correct removal of PPE is particularly important to minimize the risk of self-contamination. A PPE Buddy is required to support and assist with PPE donning and doffing procedures.

**Training sessions:** VHF modules are available on My Learning Link for AHS employees. Contact your site ICP for information on training.

**Workplace Health and Safety considerations:** The wearing of the PPE ensembles described in this guidance will result in increased heat stress and wearers can expect to perspire considerably after several minutes of working in this equipment. HCPs caring for these patients and wearing this PPE will require more break time (both in terms of frequency and duration) in order to allow for adequate rest and hydration. Caring for suspect or confirmed VHF patients while wearing the necessary PPE, and diligently adhering to the PPE doffing procedures, requires consistent concentration and careful attention to detail. Excessive fatigue can impair concentration, which can increase the risk of contamination. Fatigue should be taken into consideration when determining appropriate staffing levels for VHF patient care teams. HCPs should identify when they are becoming fatigued or overheated while wearing the PPE and indicate to the buddy that they will be exiting the room.

**Patient placement:** Single room with private bathroom is required. Airborne (negative pressure) isolation room is preferred, and essential for AGMPs. Place appropriate precaution signage on the door.

**Patient transport:** Patients to leave the room for essential purposes only. Notify receiving department of patient status and requirement for VHF precautions. Transport staff must perform a point-of-care risk assessment to determine the type of PPE required. See [PPE Requirements for Suspect/Confirmed Viral Hemorrhagic Fever \(VHF/Ebola\)](#). Wear PPE during transport and remove PPE immediately after transport is

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complete. Ensure transport takes place in a manner that minimizes patient contact with other persons. Patient must clean hands, wear a clean gown (or sheet/blanket) and wear surgical/procedure mask for any transport out of room.

**Duration of precautions:** Period of communicability is uncertain. Maintain precautions until symptoms resolve and until cleared by IPC.

**Handling and transport of laboratory specimens:** Laboratory testing for patients suspected to have VHF will only be collected and/or processed after appropriate consultation with the Zone MOH and/or microbiologist/virologist on call. See: <http://www.albertahealthservices.ca/assets/info/hp/diseases/if-hp-dis-2014-08-20-ebola-operational-update.pdf>

Information regarding the safe handling of laboratory specimens collected from patients with possible or confirmed VHF can be found at: <http://www.albertahealthservices.ca/assets/wf/lab/wf-lab-laboratory-bulletin-lab-specimen-collectionhandling-transport-and-analysis-for-patients-for-suspected-ebola-virus.pdf>

**Dedicated equipment and equipment cleaning:** Equipment must be dedicated to the patient or, preferably, disposable/single use. Any reusable equipment must be dedicated to the room for the duration of the patient stay. No equipment will be removed from the room until discharge/transfer. Cleaning and disinfection, using an AHS approved disinfectant with a broad spectrum virucide claim (e.g., 0.5% accelerated hydrogen peroxide or 1000ppm bleach), will be done with the direction of IPC.

**Environmental Cleaning:** All rooms occupied by suspect or confirmed VHF patients will be cleaned using [Environmental Services \(ES\) protocol Occupied Patient Cubicle \(Isolation\)](#) and using an AHS approved disinfectant with a broad spectrum virucide claim ( e.g., 0.5% accelerated hydrogen peroxide, or 1000ppm bleach.) ES staff shall wear PPE as per [PPE Requirements for Suspect/Confirmed Viral Hemorrhagic Fever \(VHF/Ebola\)](#). All horizontal and frequently touched surfaces should be cleaned at least twice daily and when soiled. Additional cleaning measures or frequency may be warranted in situations where excessive environmental soiling has occurred. All ES equipment/products must be dedicated to patient room and discarded in biomedical waste container after use.

All discharge isolation rooms will be cleaned using [ES Discharge – Transfer Isolation Protocol](#)  
Discard all disposable equipment in biomedical waste containers. All critical, semi-critical and non-critical reusable equipment may only be removed from the room after consultation with AHS IPC.

## VHF approved disinfectant list updated

Main Ingredient	Product Description	Available forms
Sodium Hypochlorite (Bleach)	PCS® 1000 PPM	Liquid and wipes
	PCS® 5000 PPM	Liquid and wipes
	PCS MicroClean®	Liquid
	Zochlor®	Tablets
	Sani-Cloth®	Wipes
	Complete Gel®	Gel
Accelerated Hydrogen Peroxide	Virox® RTU (.5%)	Liquid and wipes
	Precept®	Liquid
	PerDiem™ (.5%)	Liquid
	Rescue®	Gel and liquid
	Accel® PREvention™	Liquid and wipes

**Linen Handling:** Handle soiled or used linens with minimal agitation and place directly in biomedical waste containers. All soiled linens will be disposed of in biomedical waste containers.

**Waste Management:** Contain biomedical waste (e.g., sponges, dressings and surgical drapes soaked with blood or secretions) in biomedical waste containers. Use solidifying powders along with disposable bedpans, urinals and emesis basins and dispose of solidified blood, suctioned fluids, excretions and secretions into biomedical waste containers.

**Dishes/cutlery:** Use disposable dishes/cutlery if available; discard in biomedical waste container after use. Non-disposable dishes/cutlery if used must be discarded in biomedical waste container after use.

**Note:** To minimize the removal of contaminated items from the patient room and limit the movement of support staff in and out of the patient room handling of linen, waste and dishes has been modified from the usual Contact and Droplet Precautions.

**Patient Belongings:** Bag and seal patient belongings on admission. These items are to remain with patient. Disposition of items will be determined on a case-by-case basis in consultation with IPC.

**Care of Deceased Bodies: Consult the MOH immediately upon death for detailed direction on the management of the deceased body.** [PPE Requirements for Suspect/Confirmed Viral Hemorrhagic Fever \(VHF/Ebola\)](#) must be maintained when handling and transporting the deceased. Body must be placed into an AHS approved body bag. Consult the MOH immediately upon death for detailed direction on the management of the deceased body.

### Appendix: PPE requirements and donning/doffing sequences for suspect/confirmed VHF (Ebola)

#### PPE Requirements: VHF (Ebola)

There are two sets of personal protective equipment (PPE) donning and doffing sequences based on the choice of gown or coveralls. Prior to each patient interaction a point-of-care risk assessment will be performed. Healthcare provider (HCP) VHF PPE shall be used when caring for a suspect or confirmed VHF case. Buddy PPE is only to be utilized for assisting HCP and not to perform patient care.

All staff will wear hospital supplied scrubs under the PPE. Scrubs that are not visibly soiled or contaminated after PPE removal will be laundered through hospital laundry services. Visibly soiled or contaminated scrubs will be discarded in a biomedical waste container.

Correct removal of PPE is particularly important to minimize the risk of self-contamination. A Buddy is required to support and assist with HCP PPE donning and doffing procedures.

Donning and doffing areas will be identified at each site, adjacent to the room identified for suspect or confirmed VHF case care.

A “contaminated” zone will be identified within the doffing area based on the room location and space configuration.

Dispose of all PPE in a biomedical waste container (with solid, wipeable sides and a closable lid) within the “contaminated zone.” As each item is removed handle gently and drop carefully into the biomedical waste container. Ensure the biomedical waste container is located within reach of the HCP and the Buddy.

For aerosol generating medical procedures (AGMPs), an N95 respirator must be used with the gown or coverall sequence.

A PPE Buddy staff member will be present to observe and assist with HCP PPE donning and doffing. The Buddy remains on the clean side while observing and helping.

Buddy PPE will be donned and doffed according to the Buddy PPE donning and doffing sequences.

The wearing of the PPE ensembles described in this guidance will result in increased heat stress and wearers can expect to perspire considerably after several minutes of working in this equipment. HCPs caring for these patients and wearing this PPE will require more break time (both in terms of frequency and duration) in order to allow for adequate rest and hydration. Caring for suspect or confirmed VHF patients while wearing the necessary PPE, and diligently adhering to the PPE doffing procedures, requires consistent concentration and careful attention to detail. Excessive fatigue can impair concentration, which can increase the risk of contamination. Fatigue should be taken into consideration when determining appropriate staffing levels for VHF patient care teams. HCP should identify when they are becoming fatigued or overheated while wearing the PPE and indicate to the Buddy that they will be exiting the room.

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## HCP: For suspect or confirmed VHF (Ebola) GOWN SEQUENCE:

**Donning Sequence:** Put on PPE in this order on the clean side. See the [checklist and sequences](#) for more details.

1. Remove all jewelry and other items (stethoscopes, pagers, phones, lanyards, ID tags, etc.) and ensure hair is pulled away from the face and neck and secured.
2. Hand hygiene
3. Leg coverings
4. Hand hygiene
5. Surgical gloves (inner gloves) will go under the cuff of the gown
6. Gown: **Buddy** ties at back
7. Mask: surgical/procedure with ear loops (N95 for AGMP)
8. Bouffant head cover
9. Full-neck hood
10. Apron: **Buddy** ties at back
11. Face shield
12. A second set of gloves over the cuff (outer gloves) (nitrile or surgical)
13. **Buddy** ensures back of gown and apron are closed and flat.

**Doffing Sequence:** Remove PPE in this order, starting on the contaminated side. See [checklist and sequences](#) for more details.

1. Remove visible soil
2. Outer Gloves
3. Apron: **Buddy** unties apron back and gently tears apart serrated neckline and **HCP** pulls apron forward and off.
4. Face shield: **HCP** removes own, by pulling gently from the back, overhead and away from face
5. Full-neck hood, **HCP** leans forward, **Buddy** pulls hood forward and off.
6. Gown: **Buddy** unties gown at back. **HCP** eases gown forward, outward and off.
7. Untie leg coverings: **HCP** reaches down to cut
8. Inner gloves
9. Hand hygiene
10. Put on clean gloves.
11. Leg Coverings:
  - a. **HCP** standing: cuts top elastic at front of each leg covering.
  - b. Discard scissors in sharps container
  - c. With gloved hands inside leg coverings, roll each leg cover down, turning inside out to ankle.
  - d. **HCP** sits: **Do not cross your legs**. Crossing legs will cause contamination of your clothes.
  - e. **HCP** removes over foot or **Buddy** pulls off.



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- f. **HCP** can now move to “clean” side of anteroom, as each clean shoe/foot is uncovered
12. Gloves
13. Hand hygiene
14. Bouffant head cover: remove bouffant towards back of head.
15. Mask: remove ear loops and drop into biohazard container. Do not touch front of mask.
16. Hand hygiene

### HCP: For suspect or confirmed VHF (Ebola) COVERALL SEQUENCE:

**Donning Sequence:** Put on PPE in this order on the clean side. See the [checklist and sequences](#) for more details.

1. Remove all jewelry and other items (stethoscopes, pagers, phones, lanyards, ID tags, etc.) and ensure hair is pulled away from the face and neck and secured.
2. Hand hygiene
3. Coveralls to shoulders
4. Shoe covers
5. Hand hygiene
6. Surgical gloves (inner gloves) will go under the cuff of the gown
7. Mask: surgical/procedure with ear loops (N95 for AGMP)
8. Bouffant head cover
9. Coveralls hood and zipper seal
10. Full-neck hood
11. Apron: **Buddy** ties at back
12. Face shield
13. A second set of gloves over the cuff (outer gloves) (nitrile or surgical)
14. **Buddy** ensures back of gown and apron are closed and flat

**Doffing Sequence:** Remove PPE in this order, starting on the contaminated side. See [checklist and sequences](#) for more details.

6. Remove visible soil
7. Outer Gloves
8. Apron: **Buddy** unties apron back and gently tears apart serrated neckline and HCP pulls apron forward and off.
9. Face shield: HCP removes own, by pulling gently from the back, over head and away from face
10. Full-neck hood, HCP leans forward, **Buddy** pulls hood forward and off.

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### 11. Coveralls:

- a. **Buddy** unsticks and unzips coveralls. Buddy removes gloves, performs hand hygiene and dons new gloves.
- b. **Buddy**, standing behind **HCP**, grasps and rolls down coverall hood.
- c. **Buddy** rolls coveralls off **HCP** shoulders, then down to the ankles.
- d. **HCP** sits: Do not cross your legs. Crossing legs will cause contamination of your clothes.
- e. **HCP** removes coveralls over foot or Buddy pulls off (shoe covers come off too)
- f. **HCP** can now move to “clean” side of anteroom, as each clean shoe/foot is uncovered

### 12. Inner gloves

### 13. Hand hygiene

### 14. Bouffant head cover: remove bouffant towards back of head

### 15. Mask: remove ear loops and drop into biohazard container. Do not touch front of mask.

### 16. Hand Hygiene

## BUDDY: Not for patient care

**Donning Sequence:** Put on PPE in this order the on the clean side. See the [checklist and sequences](#) for more details.

1. Remove all jewelry and other items (stethoscopes, pagers, phones, lanyards, ID tags, etc.) and ensure hair is pulled away from the face and neck and secured.
2. Hand hygiene
3. Shoe covers: use chair or stool, if necessary
4. Hand hygiene
5. Gown tied in back: another person may need to help
6. Mask: surgical/procedure with ear loops
7. Bouffant head cover
8. Face shield
9. Nitrile or surgical gloves: they will go under gown cuffs

**Doffing Sequence:** Remove PPE in this order starting on the contaminated side. See the [checklist and sequences](#) for more details.

1. Remove visible soil
2. Gloves
3. Hand hygiene
4. Gown: untie the gown, another person may assist, helper must wear gloves)
5. Hand hygiene
6. Face shield: **HCP** removes own, by pulling gently from the back, overhead and away from face.
7. Hand hygiene

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8. Shoe covers: use chair or stool, if necessary
9. Step into clean area
10. Hand hygiene
11. Bouffant head cover: **HCP** removes pulling backwards off of head.
12. Mask: remove ear loops and drop into biohazard container. Do not touch front of mask.
13. Hand hygiene

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### References:

Public Health Agency of Canada, VHF Virus Disease <https://www.canada.ca/en/public-health/services/diseases/ebola/health-professionals-ebola.html>

Public Health Agency of Canada, Interim Guidance: Ebola Virus Disease (EVD); Infection Prevention and Control (IPC) Measures for Borders, Healthcare Settings, and Self-Monitoring at Home. September 12, 2014 <https://www.canada.ca/en/public-health/services/diseases/ebola/health-professionals-ebola.html> Alberta Health/Alberta Health Services Communicable Disease Advisory – Ebola Virus Disease, August 8, 2014. <http://www.albertahealthservices.ca/assets/info/hp/diseases/if-hp-dis-ebola-ed.pdf>

Alberta Health Public Health Notifiable Disease Management Guidelines for the full case definition at: <https://open.alberta.ca/publications/ebola-haemorrhagic-fever>