

**TITLE:** Viral hemorrhagic fever (VHF)

**RELATED STANDARDS:** [Airborne Precautions](#), [Droplet Precautions](#), [Contact Precautions](#)

**STANDARDS:**

In addition to [Standard Precautions](#), Contact and Droplet Precautions will be initiated on all patients requiring hospitalization with suspected or confirmed viral hemorrhagic fever (VHF). Airborne Precautions are required if an aerosol generating procedure (AGP) is performed <sup>1,2,3</sup>.

If the patient is in a facility without a private negative pressure room, then the patient will be transferred to a facility with the appropriate environmental controls.

**DESCRIPTION OF THE DISEASE**

VHF occurs as a result of infection from exotic viruses that include Ebola, Marburg and Lassa. VHF is an acute illness with prodromal symptoms similar to influenza progressing rapidly to haemorrhage and shock. Hemorrhage may be a primary feature of the clinical course with intense viremia as the disease progresses.

As of August 2014, an outbreak of Ebola virus has affected the Western African countries of Guinea, Liberia, Nigeria and Sierra Leone. Previous outbreaks have occurred in Uganda, Democratic Republic of Congo and Sudan.

**VHFs do not occur naturally in Canada.** Most individuals who present at PHC with signs and symptoms of VHF will be travellers who have returned from countries with known VHF cases (within three weeks of returning to Canada) or contacts of these travellers.

**Period of Communicability**

The incubation period varies with each type of VHF, from 2 to 21 days. The infectious period also varies with each type of VHF, and may be several weeks.

**Route of Transmission**

Transmission of the virus occurs by direct or indirect contact with blood, body fluids and respiratory secretions of the infected individual

- The risk of exposure to blood or other body fluids and the opportunity for virus aerosolization increases as the patient's condition deteriorates.

- Parenteral exposure has been associated with a higher risk of transmission.

## ASSESSMENT AND INTERVENTIONS

### Case Definition<sup>4</sup>

A possible case is defined as:

A patient presenting with symptoms consistent with VHF *and* risk factors as follows:

- 1) Clinical criteria, which include fever of greater than 38.6 degrees Celsius, **AND** additional symptoms such as severe headache, muscle pain, vomiting, diarrhea, abdominal pain, or unexplained hemorrhage; **AND**
- 2) Epidemiologic risk factors within the past 21 days before the onset of symptoms, such as contact with blood or other body fluids or human remains of a patient known to have or suspected to have VHF; residence in—or travel to—an area where VHF transmission is active; or direct handling of bats, rodents, or primates from disease-endemic areas

### Triaging Patients Suspected of VHF

**If a patient meets the above case definition, place the patient into a private room with a dedicated bathroom and anteroom. Contact the Medical Microbiologist on-call immediately (i.e., as soon as suspected or if there is a possibility of an impending admission) through the PHC Call Centre at (604) 682-2344.**

**The attending physician must notify the VCH Medical Health Officer at (604) 675-3900.**

Infection Prevention and Control will:

- Provide direction related to the infection control management based on the current guidelines from the Centers for Disease Control and Prevention (CDC) for VHF.
- Liaise with the Vancouver Coastal Health Authority Medical Health Officer (MHO).
- Liaise with the appropriate stakeholders at PHC including (but not limited to) the on-call administrative leader, Emergency Department, Intensive Care Unit (ICU), Infectious Diseases, Respiratory Services, Disaster Planning, Laboratory Departments, VCH MHO, Senior Administration, Communications, Occupational Health and Safety (OH&S) and Waste Management.
- Direct caregivers are to be limited to a small number of individuals familiar with the care and management of these patients. Health care workers (HCWs) entering the room should be kept to a minimum and a log book for entry needs to be completed.

- Students and trainees are not to be included in the care team.

### **Infection Prevention and Control Precautions<sup>1,2,3,5</sup>**

In addition to Standard Precautions, all patients suspected of VHF should be placed, at the minimum, on Droplet and Contact Precautions in accordance with CDC and WHO recommendations. If an AGP (Eg. intubation or bronchoscopy) is performed, Airborne/Contact Precautions are required. The following additional precautions should be applied:

Private room with an anteroom and dedicated bathroom is required

- Keep door tightly shut at all times.
- Compliance with hand hygiene
- The following personal protective equipment (PPE) will be available:
  - Gloves (Double glove if there is potential for significant exposure to body fluids)
  - Fluid resistant gowns
  - Procedure/Surgical mask
  - Fluid repellent fit-tested N95 respirators
  - Protective eyewear (goggles and/or face shield)
  - Disposable shoe covers
- Recommended PPE should be worn prior to entering the patient's room. Upon exiting the patient's room, care should be taken in doffing PPE (in the anteroom) without contaminating one's eyes, mucous membranes or clothing with potentially infectious material. ([Donning](#) and [Doffing](#) PPE)
- Whenever possible, avoid Aerosol Generating Procedures (AGP) for patients with suspected VHF. In situations where AGP is required, the number of health care workers during the procedure should be minimized. Airborne/Contact precautions in a negative pressure room with PPE (including fit-tested N95 respirators) for all health care workers are required during the procedure. Environmental cleaning will be conducted 1 hour after the procedure, and trained personnel will collect equipment that are not disposable for appropriate disinfection as per PHC MDRD policies. The use of CPAP and BIPAP are strongly discouraged.
- The duration of precautions will be determined on a case-by-case basis in

conjunction with the VCH MHO.

- A log of all persons entering the room should be maintained.
- Blood pressure cuff, stethoscope, tourniquet and disposable non mercury thermometers **will be dedicated to this patient only. The use of dedicated (and disposable) medical equipment is preferred.** Remove all unnecessary items from the room.
- Disposable food trays and cutlery should be used.
- Laundry hamper should be placed in the anteroom.

**Transportation of the patient** within the hospital is to be kept to a minimum, limited to essential purposes only, and done in a way to minimise exposure to patients and employees, (e.g., perform bedside imaging whenever possible and/or feasible). During transport, the patient will wear a procedure/surgical type mask (a N95 mask is not required for the patient as procedure/surgical masks are effective in decreasing aerosolization of exhaled infectious particles).

### **Environmental Cleaning and Waste Management**

Viruses associated with VHF are enveloped RNA viruses that are susceptible to standard hospital disinfectants. It is imperative to have diligent cleaning and safe handling of potentially contaminated material to prevent potential transmission in hospital.

- HCW performing environmental cleaning of the patient's room will follow the recommended PPE.
- IPAC will liaise with the environmental cleaning managers to ensure adherence to cleaning protocols and PPE for staff.
- Prompt cleaning of spills or surfaces contaminated with body fluids are required.
- If a mop and bucket are used, they must be kept in the patient room and the contents of the bucket emptied into the hopper in a manner that minimizes aerosolization. Disposable mop heads and cleaning cloths are preferred.
- Needles and other sharps should be used and disposed of in accordance with recommendations for safe sharps use.
- Bed linens and solid medical waste (e.g., syringes, tubing) contaminated with blood or other bloody fluids should be handled with minimal agitation. Management of medical waste will be conducted following established PHC policy. Waste receptacles should be lined with biohazard bags and contained in the room. Care

must be taken when sealing the bag to reduce expulsion of air (and potential viral aerosols) into the room. When removed from the room, the biohazard bag should be wiped down with a disinfectant wipe and placed in a second biohazard bag and secured prior to removing in a covered cart to a designated biohazardous waste holding area. Notify the Area Waste Manager or BISS representative prior to transport.

- Medical waste such as feces and vomitus can be disposed of in the sanitary sewer at the bedside. Care should be taken to avoid splashing when disposing of these materials. Sprayers must not be used to clean the toilet or hopper. Hoppers should have splash shields.

### **LABORATORY TESTING FOR PATIENTS WITH SUSPECTED VHF<sup>7</sup>**

Due to the potential risks associated with handling infectious materials, laboratory testing should be limited to the minimum necessary for essential diagnostic evaluation and patient care. Experienced laboratory or nursing staff must collect all blood specimens. Alert laboratory staff to the nature of the specimens prior to sending them to the clinical laboratory. The Laboratory Physician or Medical Microbiologist on-call will be responsible for designating responsible laboratory personnel.

All laboratory testing for patients with suspected VHF will be done at the St. Paul's Hospital (SPH). If the patient is admitted to Mount Saint Joseph Hospital, all samples will be transported to SPH in designated transport containers by personnel certified for the transportation of dangerous goods. Transport of patient samples between facilities should be minimized as much as possible.

#### **Specimen collection and handling:**

- Phlebotomists will don recommended PPE before entry to the patient's room.
- Glass containers will be avoided whenever possible. Venipuncture equipment will be placed in sharps buckets for disposal after use.
- Specimens will be double-bagged in break-proof, airtight and watertight bags, which have been fully labelled with the patient's identification and possible diagnosis. Bags containing specimens should be wiped with a disinfectant before they are removed from the patient's room.
- Specimens will be hand delivered by persons knowledgeable of the case and given to the designated medical staff in the laboratory. Samples must **not** be sent through the pneumatic transport system.

#### **Laboratory testing for VHF:**

- Ebola testing is performed at the National Microbiology Laboratory, and testing will be coordinated through the PHC Medical Microbiology/Virology laboratory.

- Collect 4 mL of whole blood in purple top EDTA tubes (submitted in aliquots in sterile 1.5-2.0 mL tubes).
- Store samples in the refrigerator or frozen until shipped for testing.

#### Routine Laboratory Testing:

- Laboratory testing for patients with a high-risk exposure (eg. contact with blood or other body fluids or human remains of a patient known to have or suspected to have VHF) should be minimized to the following:
  - CBC, electrolytes, creatinine, glucose, liver function tests, coagulation factors
  - Blood cultures x 2 sets
  - Malaria screen
- All testing should be performed at the main SPH laboratory, rather than on the ward or at the bedside.
- Laboratory personnel should wear appropriate PPE while performing testing.

#### Visitors

##### Visitors will:

- Be limited to family members, and need approval from the attending physician and Infection Prevention and Control to visit. Visitors must sign the logbook.
- Wear gown, gloves and a mask and protective eyewear, (i.e. they will follow the same precautions as the staff).
- Be instructed on how to remove / discard protective apparel and hand hygiene.
- Be asked to follow-up with their local Public Health department regarding self-monitor for symptoms on a daily basis until a predetermined number of days after their last contact with the patient. Visitors should be aware to minimize contact with others as directed by Public Health.

#### Identification and Management of Contacts

All patient and employee contacts will be identified and followed by Infection Prevention and Control and Workplace Wellness and Safety under the direction of the Vancouver Coastal Health Authority.

Persons with percutaneous or mucocutaneous exposure to body fluids should immediately wash the affected area with soap and water. Mucous membranes should be irrigated with copious amounts of water or eyewash solution. HCW with an unprotected exposure (eg. patient contact

without recommended PPE) should immediately stop working, and inform their supervisor and OH&S for evaluation and follow-up. Exposed persons should receive medical evaluation and follow-up care, including fever monitoring twice daily for 21 days after exposure. Consultation with an infectious disease expert and/or Medical Health Officer is recommended for exposed persons who develop fever within 21 days of exposure.

### **Handling of Human Remains**

- Handling of the body should be minimized and the remains should not be embalmed.
- Remains should be wrapped in sealed leak-proof material and cremated or buried promptly in a sealed casket.
- Autopsies of patients with confirmed VHF should not be conducted.
- Patient dedicated materials should be discarded.

### **EDUCATION AND RESOURCES**

Infection Prevention and Control and Workplace Wellness and Safety will provide educational sessions under the direction of the Vancouver Coastal Health Authority, BCCDC and Health Canada.

["Viral hemorrhagic fevers: fact sheets" CDC](#)

### **DOCUMENTATION**

- Enter date and time in progress notes that Transmission Based Precautions were started and discontinued.
- Document other interventions as appropriate
- Maintain a list of all care givers who have contact with patient

### **REFERENCES**

1. [PHAC. Infection Control Guidelines, Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care. 2012.](#)

2. [WHO. Interim Infection Control Recommendations for Care of Patients with Suspected or Confirmed Filovirus \(Ebola, Marburg\) Haemorrhagic Fever. 2008](#)
3. [CDC. Infection Prevention and Control Recommendations for Hospitalized Patients with Known or Suspected Ebola Hemorrhagic Fever in U.S. Hospitals. 2014](#)
4. [CDC. Case Definition for Ebola Virus Disease \(EVD\). 2014.](#)
5. [CDC. Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings 2007.](#)
6. [CDC. Interim Guidance for Managing Patients with Suspected Viral Hemorrhagic Fever in U.S. Hospitals. May 19, 2005.](#)
7. [CDC. Interim Guidance for Specimen Collection, Transport, Testing, and Submission for Patients with Suspected Infection with Ebola Virus Disease. 2014.](#)
8. Vancouver Coastal Health Authority. Unusual Communicable Disease Events. August, 2014.

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**Approval Body:** PHC Infection Control Standards Committee