About This Chapter

This chapter contains information on Viral Hemorrhagic Fever (VHF), a condition affecting multiple body systems and caused by different viruses.
The chapter is divided into two parts:

- **Part I General** - includes notification timelines for all VHFs, as well as surveillance case definitions and lab interpretation guidance for selected VHF viruses, including:
  - Crimean Congo Hemorrhagic Fever virus
  - Lassa virus
  - Marburg virus
  - Rift Valley Fever virus
- **Part II Ebola virus & other related viruses (orthoebolaviruses)** - includes case definition and case and contact management information for Ebola Disease which includes:
  - Ebola virus
  - Sudan virus
  - Taï Forest virus
  - Bundibugyo virus

The response to a VHF case requires a system-wide approach beyond the guidance provided within the Communicable Disease Control Manual. Refer to the Saskatchewan Health Authority (SHA) Infection Prevention and Control (IPAC) Ebola/VHF Toolkit and relevant organizational protocols.

Notification Timeline:

Exposures (potential or known) to VHF Cases

The PHAC Quarantine Officer to Medical Health Officer[1]: Immediately

Public health may also receive notification of VHF exposures from health care providers or members of the public.

Public Health to Ministry of Health[2]: Immediately

Public Health Follow-up Timeline: Immediately

[1] Under the federal Quarantine Act, the Quarantine Officer (QO) can issue an Order to report to the local public health authority when a traveller has a suspect communicable disease but does not pose an immediate risk of significant harm to public health. Both the traveller and the QO are required to notify the local public health authority when this Order is issued. The QO will contact the local or on-call MHO directly.
[2] Report using Outbreak Notification and Summary Report form. As per the Disease Control Regulations (s.20), a VHF exposure may be considered an immediate threat of a Category I outbreak.

Human Cases of VHF[3]

From Lab/Practitioner to Public Health[4]: Immediately
From Public Health to PHAC[5]: Immediately
From Public Health to Ministry of Health[6]: Immediately

Public Health Follow-up Timeline: Initiate immediately

Public Health Purposes for Notification of VHF:

- To prevent further transmission of VHF from imported cases.
- To rapidly stop the chains of transmission of VHF in the community by targeting public health measures to those highest risk for transmission.
- To prevent endemicity of VHF in Canada by preventing introduction in additional higher risk groups and the greater Canadian population through contact tracing.
- To protect public health and health care in Canada, including those services which can diagnose and manage cases, in the context of community transmission of VHF.
- Ensure the public health response and clinical management are evidence-based by enabling epidemiologic studies, research and evaluation activities that will address prioritized knowledge gaps.
- To track epidemiology trends of VHF in Saskatchewan including risk factors and distribution;
- To monitor the effectiveness of prevention and control measures;
- To take timely and evidence informed actions on outbreaks; and
- To inform the public and medical community about VHF.

[3] Includes all confirmed, probable and suspect cases of VHF as well as persons under investigation for Ebola disease.
[4] Local Public Health should confirm the lab/practitioner has notified SHA Health Emergency Management (HEM) and/or notify SHA HEM immediately to initiate Level 4 Pathogen response. See SHA IPAC Ebola/VHF Toolkit. SHA HEM is responsible for notifying Ministry of Health's Health Emergency Management Unit (HEMU).
[5] Local Public Health is required to notify the Health Portfolio Operations Centre (HPOC) immediately using the 24-hour emergency line at 1-800-545-7661. In addition, complete the Ebola Disease Case Report Form when applicable: https://www.canada.ca/en/public-health/services/diseases/ebola/health-professionals-ebola/case-report-form.html. Copy OCMHO and HEMU on all e-mail communications sent to PHAC.
[6] Send copy of Ebola Disease Case Report Form (when applicable) and Outbreak Notification and Summary Report form to Population Health Branch via cdc@health.gov.sk.ca.

Table 1. VHF Surveillance Case Definitions[7] (adapted from Public Health Agency of Canada [PHAC], 2008)
See Part II for case definitions for Ebola virus and other related viruses (orthoebolaviruses)

Confirmed Case	Clinical evidence of illness* with laboratory confirmation of infection: • Detection of virus-specific RNA by revers-transcriptase PCR from an appropriate clinical specimen (e.g. blood, serum, tissue) **AND** • Demonstration of virus antigen in an appropriate clinical specimen (e.g. blood, serum, tissue) by enzyme immunoassay (EIA) **OR** One of the above criteria **AND** laboratory confirmation using at least one of the following: • demonstration of virus antigen in tissue (skin, liver or spleen) by immunohistochemical or immunofluorescent techniques • demonstration of specific IgM antibody by EIA, immunofluorescent assay or Western Blot • demonstration of a fourfold rise in IgG serum antibody by EIA, immunofluorescent assay or Western Blot • reverse-transcriptase PCR on an independent target gene and/or independent sample or confirmation through another reference laboratory. **OR** Isolation of virus from an appropriate clinical specimen (blood, serum, tissue, urine specimens or throat secretions.
Probable Case	Clinical evidence of illness* **AND** a history within the three weeks before onset of one of the following: • travel in a specific area of a country where an outbreak of VHF has recently occurred; • Contact with a suspect, probable or confirmed case; • Direct contact with blood or other body fluid secretions or excretions of a person or animal with a confirmed or probable case of VHF • Work in a laboratory or animal facility that handles hemorrhagic fever viruses.

[7] Surveillance case definitions ensure uniform reporting to allow comparability of surveillance data. The definition is not intended to be used for clinical or laboratory diagnosis or management of cases.

Suspect Case	Clinical evidence of illness* **AND** • Pending (or invalid) laboratory PCR result (Saskatchewan Ministry of Health, June 2022).

***Clinical Evidence of Illness:**

- When the type of VHF is not yet known, consider any of the disease-specific signs and symptoms (below) to support the case definition.
- **Crimean Congo VHF**: Acute viral illness consisting of sudden onset of fever, malaise, generalized weakness, anorexia, irritability, confusion, headache and pain in the limbs and groin. Fever generally lasts 5-12 days and is followed by a prolonged convalescent phase. Acute symptoms are usually accompanied by flushing, conjunctival injection and petechial or purpuric rash involving mucosal surfaces, chest and abdomen. Vomiting, abdominal pain and diarrhea are occasionally seen. Bleeding may be seen from gums, nose, lungs, uterus and GI tract. There is often thrombocytopenia, mild hematuria and proteinuria, and evidence of hepatic involvement. Severe cases may be associated with liver failure.

- **Lassa VHF**: Acute viral illness lasting one to four weeks. Gradual onset of symptoms, including fever, headache, generalized weakness, malaise, sore throat, cough, nausea, vomiting, diarrhea, myalgia, and chest and abdominal pain. Fever may be persistent or intermittent. Inflammation and exudation of the pharynx and conjunctivae is commonly observed. Many cases are mild or asymptomatic. Severe cases may result in hypotension, shock, pleural effusion, hemorrhage, seizures, encephalopathy and proteinuria, resulting in edema of the face and neck.

- **Marburg VHF**: Severe acute viral illness consisting of sudden onset of fever, malaise, myalgia, headache, conjunctival injection, pharyngitis, vomiting and diarrhea that can be bloody. It is often accompanied by a maculopapular or petechial rash that may progress to purpura. Bleeding from gums, nose, injection sites and GI tract occurs in about 50% of patients. Dehydration and significant wasting occur as the disease progresses. In severe cases, the hemorrhagic diathesis may be accompanied by leukopenia; thrombocytopenia; hepatic, renal and central nervous system involvement; or shock with multi-organ dysfunction.

- **Rift Valley VHF**: Human infections with Rift Valley fever are usually associated with a brief, self-limited febrile illness. Most patients experience sudden onset of fever, malaise, severe myalgias with lower back pain, chills, headache, retro-orbital pain, photophobia and anorexia. Fever usually lasts for four days. In a minority of patients, fever returns after two or three days accompanied by return of symptoms as well as flushed face, nausea, vomiting and injected conjunctivae. Severe disease is associated with bleeding, shock, anuria and icterus. Encephalitis and retinal vasculitis can also occur.

Additional Background Information

Causative Agent

VHF is caused by select viruses, including those outlined in **Table 2**.

Table 2. Summary of VHF Viruses Identified in Surveillance Case Definitions

Family	Genus/Species	Virus Name
Arenaviridae	*Mammarenavirus lassaense*	Lassa virus
Bunyaviridae	*Phleborvirus*	Rift Valley Fever virus
Filoviridae	*Marburg marburgvirus*	Marburg virus (MARV)
	Refer to Part II for Ebola virus and other related viruses (orthoebolaviruses).	
Nairoviridae	*Orthonairovirus haemorrhagiae*	Crimean-Congo Hemorrhagic Fever virus

Signs and Symptoms

Clinical presentation of VHF is dependent on the causative agent. However, the following are common signs and symptoms:

- Fever
- Severe headache
- Muscle and/or joint pain
- Weakness and fatigue
- Petechial rash or bruising
- Vomiting
- Diarrhea
- Abdominal pain
- Overt bleeding not related to injury

Lab Results and Interpretation

- Culture and antibody detection tests for VHFs are available at National Microbiology Laboratory (NML), however these are not performed for diagnostics routinely.
- Antigen testing not available at NML.

Table 3. Interpretation of Test Results

Test Name- Panorama	**Test Name-** Lab Report	**Reported Result**	**Interpretation as per Case Definition** (in conjunction with clinical presentation)
PCR/NAAT	Probe PCR Assay (qPCR) OR Gel PCR Assay	Positive	Confirmed Case[1]
		Equivocal[2]	Equivocal PCR results on two different specimens: Confirmed case. Equivocal PCR result from one specimen: Not a case
		Invalid	Suspect case
		Pending	Suspect case
		Negative	Not a case
[1]Confirmed case supported when there are two target genes detected (indicated by a positive result for either qPCR **or** Gel PCR Assay). [2] Indicates 1 of 2 targets are detected.			

Public Health Investigation

In the event of a suspected/probable/confirmed case of VHF, refer to Public Health Investigation in Part II Ebola virus and other related viruses (orthoebolaviruses) for case and contact management guidelines. Consider potential differences between VHF diseases including risk factors, incubation periods, and periods of communicability.

Revisions

Date	Change
January 7, 2025	• NEW

References

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About This Chapter

Part II includes specific information on *orthoebolaviruses* (Ebola virus, Sudan virus, Bundibugyo virus, and Taï Forest virus) that cause illness collectively referred to as Ebola Disease within the category of Viral Hemorrhagic Fever.

Notification Timeline: Refer to Part I General

Table 1. Ebola Disease Surveillance Case Definitions[8] (Public Health Agency of Canada, 2023)

Confirmed Case	A person with laboratory confirmation of orthoebolavirus (formerly ebolavirus) infection using at least one of the methods below: • Isolation and identification of virus from an appropriate clinical specimen (e.g., blood, serum, tissue, urine specimens, throat secretions or other body fluids) (performed at the National Microbiology Laboratory); **OR** • Detection of virus-specific RNA by reverse-transcriptase PCR from an appropriate clinical specimen (e.g., blood, serum, tissue, other body fluids) using two independent gene targets **AND** confirmed by the National Microbiology Laboratory; **OR** • Demonstration of virus antigen in tissue (e.g., skin, liver or spleen) by immunohistochemical or immunofluorescent techniques **AND** another test (e.g., PCR); **OR** • Demonstration of specific IgM **OR** IgG antibody by EIA, immunofluorescent assay or Western Blot by the National Microbiology Laboratory or an approved WHO collaboration centre; **OR** • Demonstration of a fourfold rise in IgG titre by EIA, immunofluorescent assay from an acute vs. a convalescent serum sample (performed at the National Microbiology Laboratory).
Person Under Investigation	A person with Ebola disease-compatible symptoms[1] with or without pending laboratory results for Ebola disease

[8] Surveillance case definitions ensure uniform reporting to allow comparability of surveillance data. The definition is not intended to be used for clinical or laboratory diagnosis or management of cases.

	AND • A travel history to an Ebola disease affected area within 21 days of symptom onset; **OR** • exposure to one or more of the epidemiological risk factors[2] within 21 days of symptom onset.

[1] A person with Ebola disease-compatible symptoms is defined as: An individual presenting with fever (temperature ≥ 38.0 degrees Celsius) **OR** at least one of the following symptoms/signs:

- subjective fever
- malaise
- myalgia
- headache
- arthralgia
- fatigue
- loss of appetite
- conjunctival redness
- sore throat
- chest pain
- abdominal pain
- nausea
- vomiting
- diarrhoea that can be bloody
- haemorrhage
- erythematous maculopapular rash on the trunk

[2] Epidemiological risk factors are defined as:

- Individual who cared for a case of Ebola disease
- Laboratory worker handling orthoebolavirus or processing body fluids from a case of Ebola disease
- Individual who spent time in a healthcare facility in an Ebola disease affected area where cases of Ebola disease are being treated
- Sexual contact with an Ebola disease case
- Close contact in households, healthcare facilities, or community settings with a person with Ebola disease while the person was symptomatic - close contact is defined as being within approximately 2 meters (6 feet) of a person with Ebola disease for a prolonged period of time
- Contact with any human remains of a case of Ebola disease **OR** contact with human remains in an Ebola disease affected area
- Contact with bats, primates or wild animal bush meat from Ebola disease affected areas
- A travel history to an Ebola disease affected area within 21 days

Epidemiology and Occurrence

Orthoebolavirus (formerly ebolavirus) was first discovered in 1976 near the Ebola River in what is now the Democratic Republic of Congo. Since then, there have been outbreaks in several African countries where the virus infects people from time to time.

Imported cases associated with Ebola outbreaks have been reported in the US, and countries in Africa and Europe.

There has never been a case of Ebola disease in Canada.
Additional information is available from:

- Government of Saskatchewan
- Public Health Agency of Canada (PHAC)
- World Health Organization (WHO)

Additional Background Information

Causative Agent

Viral Hemorrhagic Fever may be caused by viruses within the genus o*rthoebolavirus* (Centers for Disease Control and Prevention [CDC], 2024). There are four viruses within this genus known to cause human disease as outlined in **Table 1**.

Table 2. Summary of Orthoebolaviruses

Family	Genus	Virus Name
Filoviridae	*orthoebolavirus*	Ebola virus
		Sudan virus
		Taï Forest Virus
		Bundibugyo virus

Signs and Symptoms

Ebola disease is severe and acute, typically starting with an abrupt onset of fever, malaise, myalgia, headache, and sore throat followed by gastrointestinal symptoms (anorexia, abdominal discomfort/pain, vomiting, diarrhea), and maculopapular rash (Heymann, 2022). Later stage symptoms include severe vomiting and diarrhea, internal and external bleeding (may present as petechiae, bleeding from venipuncture sites, bleeding mucous membranes or blood in stool or vomitus), chest pain, shortness of breath, confusion, seizures, and conjunctival injection.
Non-fatal cases have a fever for several days and usually improve after 6 to 11 days. However, full recovery occurs over a long period of time with potential for complications including myelitis, recurrent hepatitis, psychosis, or uveitis (PHAC, 2024).
Massive bleeding, septic shock and multiorgan failure are common complications for patients with fatal disease. For these individuals, death typically occurs between days 6 to 16 of complications (CDC, 2024). The average case fatality rate is 50% (range of 25% to 90% depending on the species) (PHAC, 2024).

Reservoir/Source
Ebola disease is animal-borne, with fruit bats being the most likely reservoir (Heymann, 2022). Infected animals can transmit to other animals and it first spreads to humans through direct contact with the blood, body fluids, and tissues of animals.

Incubation Period
Symptoms may appear anywhere from 2 to 21 days after contact with the virus, usually between 6 to 10 days (PHAC, 2024).

Period of Communicability
Ebola disease is communicable from person-to-person from the onset of symptoms.

Communicability increases as the severity of illness progresses and the case remains communicable during the post-mortem period. Recovered individuals remain communicable as long as blood and body fluids (including semen and breast milk) contain the virus (may persist for weeks or months).

Mode of Transmission
The transmission of orthoebolavirus to humans may occur through:

- Human to human contact with:
    - Blood or body fluids (i.e. urine, feces, saliva, sweat, vomit, breast milk, amniotic fluid, semen, and vaginal fluid) of a person who is sick with, has died from, or who has recently recovered from Ebola disease
    - Objects (such as clothes, bedding, needles and medical equipment) contaminated with body fluids from a person who is sick or has died from Ebola disease. Ebola virus can survive on dry surfaces and in liquids for several days (PHAC, 2024).
    - Semen from a person during active phase or convalescent period (seminal fluid may contain virus for approximately one year (World Health Organization [WHO], 2016). See Testing.
    - There is limited evidence on how long the virus lasts in vaginal fluid and it is unknown if it can be sexually transmitted from females (WHO, 2016).

- Animal to human—transmission from infected live or dead animals (such as fruit bats or non-human primates)
- Foodborne transmission- In certain parts of the world, Ebola virus may spread through the handling and consumption of wild animal meat.

- Vertical transmission to an infant may occur during pregnancy and/or delivery and while breastfeeding (PHAC, 2024).
- There is no evidence of airborne or vector-borne transmission (PHAC, 2024; CDC, 2024).

Risk Factors (PHAC, 2023)
- Travel to an Ebola disease affected area within 21 days, including the following exposures:
  - Time spent in a healthcare facility where cases of Ebola disease are being treated
  - Contact with any human remains of a case of Ebola disease OR contact with human remains in an Ebola disease affected area
  - Contact with bats, primates or wild animal bush meat from Ebola disease affected areas
- Contact to a known case (see Contact definition).
- Occupational exposure, including health care worker or lab worker.
- Sexual contact with an Ebola disease case, including during the convalescent period until semen no longer tests positive for orthoebolavirus (see Testing).

Lab Reports and Interpretation
- Diagnostic testing using the molecular testing approaches of the NML may be impacted by recent vaccination with Ebola vaccine (e.g., rVSV-EBOV vaccine). For this reason, it is important to inform the NML of the vaccine status of the person under investigation (PUI).
- It should be noted that testing negative for Ebola disease within 72 hours of symptom onset does not rule out Ebola disease, and in this case, testing should be repeated.
- Culture and antibody detection tests for orthoebolaviruses are available at NML, however these are not performed for diagnostics routinely.
- Antigen testing is not available at NML.

Table 3. Interpretation of Test Results

Test Name- Panorama	**Test Name-** Lab report	**Results**	**Interpretation as per Case Definition** (in conjunction with clinical presentation)
PCR/NAAT	Probe PCR Assay (qPCR) OR Gel PCR Assay	Positive	Confirmed Case[1]
		Equivocal[2]	Not a case
		Invalid	Person Under Investigation
		Pending	Person Under Investigation

		Negative	Not a case
[1]Confirmed case supported when there are two target genes detected which is indicated by a positive result for either qPCR **or** Gel PCR Assay. [2] Indicates 1 of 2 targets are detected.			

Treatment/Supportive Therapy

- *Treatment of patients with confirmed EVD in Canada designated Ebola disease treatment centres, as directed by federal and provincial protocols.*
- *The Association of Medical Microbiology and Infectious Diseases of Canada (AMMI Canada) along with the Canadian Critical Care Society and Canadian Association of Emergency Physicians have published guidelines pertaining to the care of patients with suspected and confirmed EVD.*
- *Access to available therapeutics from the PHAC's Health Portfolio Operations Centre (HPOC) must be coordinated through the Ministry of Health's Health Emergency Management Unit.*

Public Health Investigation

Ebola virus has been studied more than the other species (Sudan virus, Taï Forest virus, and Bundibugyo virus) and it has informed most of the current scientific evidence. However, all these species are expected to behave similarly and therefore the same case and contact management can be applied (PHAC, 2024). When applying to other VHF diseases, public health investigation should consider potential differences including risk factors, incubation periods, and periods of communicability.

I. Case (Person Under Investigation (PUI)/Confirmed)

- All reports of a PUI or confirmed case should be immediately investigated and managed to prevent transmission to others. Refer to Attachment—Viral Hemorrhagic Fever Case Data Collection Worksheet.
- **Immediately implement isolation requirements.** See Isolation and Exclusion.

History

- Onset of illness—to determine incubation period and period of communicability in order to identify possible source and contacts.
- Identify potential source(s) of exposure(s) (see Risk Factors).

Public Health Interventions

Assessment

- Assess for Contacts.
  Note: When animals have been exposed to a confirmed human case, refer to Guidance for management of companion animals that have been exposed to a human with Ebola virus disease.

Communication

- Directly notify each close contact.
  - Communication to out of province contacts to occur via Interjurisdictional Referral of a Communicable Disease form. See **Appendix B—Interjurisdictional Communication and Referrals** (*in development—expected release 2025*).
- Consult with Ministry of Health prior to issuing a public advisory, if required.

Education

- Provide information on measures for the management of contaminated waste and linen in the home. See PHAC guidelines Measures for the management of Ebola virus disease-associated waste and linen in home settings.
- Upon hospital discharge, provide education and counselling to address the associated disease sequelae and prevent transmission to others during convalescence since orthoebolaviruses can persist in certain body fluids and organs for weeks to months.
    - For male cases, it is recommended that until their semen is determined to be orthoebolavirus-free through testing (see Testing), or if testing is not done for 12 months from symptom onset, the individual should be advised to either abstain from sexual contact or use safer sex practices including correct and consistent condom use. Also, cases should practice good hand and personal hygiene, by immediately and thoroughly washing with soap and water after any physical contact with semen, including after masturbation.
    - Cases who discontinued breastfeeding during acute illness should not resume breastfeeding upon discharge and until their breastmilk is determined to be orthoebolavirus-free through testing (see Testing). Individuals should also practice good hand hygiene and personal hygiene when taking breastmilk samples by immediately washing with soap and water after any physical contact with breastmilk.
    - Cases should ensure others do not come into contact with their body fluids (including urine, feces, blood, vomit, saliva, sweat, breastmilk, and semen) or any objects that may have come in contact with their body fluids (including linens, clothing, toilet, toiletries).

Isolation and Exclusion

- PUI should immediately self-isolate until they can be transported to a designated assessment facility and undergo a medical assessment to confirm or rule out Ebola disease.
    - PUI should maintain a 2-metre distance and avoid physical contact with people or pets/animals.
    - Depending on the nature/severity of symptoms and proximity to the facility:
        - Advise the PUI to take a private vehicle to the hospital while avoiding direct contact with others, OR
        - Arrange for an ambulance.

- Prior to transport, alert paramedic services (if involved) and the receiving facility of the client's orthoebolavirus exposure and symptoms in advance to help ensure that appropriate infection prevention and control measures are in place.
- Refer to Saskatchewan Health Authority (SHA) Infection Prevention and Control (IPAC) VHF/Ebola Toolkit.

- Confirmed cases should be hospitalized in designated Ebola disease treatment centres that have the capacity to provide appropriate treatment and effective isolation until infectious risk is minimal.
  - Liaise regularly with appointed hospital staff for the duration of the patient's hospitalization, to monitor progress and be actively involved with discharge planning.
  - The decision to discharge the case should be made jointly in consultation with infectious disease specialist and the MHO. Discharge may be considered if:
    - The patient has been symptom free for greater than 72 hours.

      AND
    - Two consecutive blood samples, obtained at least 24 hours apart, have been negative for the orthoebolaviruses by PCR testing.
- Cases do not need to be isolated or excluded from school/work during their convalescence. However, they should be counselled regarding possible transmission of Ebola disease and ways to prevent transmission.
- A Medical Health Officer (MHO) may issue a Public Health Order to enforce isolation requirements when there is a significant risk to the public.

Testing

- Ensure PUI receives immediate laboratory diagnostic testing at a designated assessment site. See Exclusion and Isolation.
- See Exclusion and Isolation for testing recommendations prior to hospital discharge.
- Testing of semen by RT-PCR should be performed at 3 months from disease onset, and if still positive then every month thereafter, until two consecutive samples test negative (with an interval of at least one week between tests) (PHAC, 2024).
- Breastmilk determined orthoebolavirus free with two consecutive samples of breastmilk obtained with an interval of at least 24 hours, test negative by RT-PCR (PHAC, 2024).

Referrals

- Following an assessment of the home setting to determine the specific areas/room(s) visibly or potentially contaminated, identify an environmental services company to appropriately dispose of waste and linen. See PHAC guidelines Measures for the management of Ebola virus disease-associated waste and linen in home settings.

  NOTE: The handling of EVD-associated waste and environmental cleaning in the home setting should not be done by family/other household members or friends.

II. Contacts/Contact management

- Contact tracing of a **confirmed case** or **PUI** should begin immediately.
  See Attachment—Viral Hemorrhagic Fever Contacts Data Collection Worksheet.

Contact Definition:

A contact is a person who has been or may have been exposed to an infectious case or a source of orthoebolavirus in the past 21 days. **Table 4** outlines the level of risk for contacts.

When assessing contact risk, it is important to use clinical judgement as there may be instances where a person was in close proximity to someone with Ebola disease, without known physical contact with the individual, their bodily fluids, or with contaminated objects or surfaces in their environment. Management of contacts based on the risk of exposure requires careful risk assessment considering:

- the length and number of interaction(s) (longer and multiple exposures potentially increasing the risk)
- the kind of symptoms the individual with Ebola disease was exhibiting at the time (such as coughing, vomiting, external bleeding and/or diarrhea, which may generate infectious droplets and/or contaminate the environment more heavily)
- the distance between the individual with Ebola disease and the contact (the risk being inversely proportional to the distance)
- the use of appropriate infection prevention and control measures, including personal protective equipment, when applicable

Table 4. Risk of Exposure for Contacts During Period of Communicability (PHAC, 2024)

Level of Risk[9]	**Definition**
High Risk	• All household and sexual contacts of a case • Did not adhere to recommended infection prevention and control (IPAC) measures **OR** due to a breach in IPAC measures **AND** physical contact[10] with one or more of the following: ○ the body surface/mucous membranes of someone with symptomatic Ebola disease, the individual's body fluids, or dead body; ○ objects or surfaces that may be contaminated with orthoebolaviruses from the body fluids of someone with Ebola disease, including bedding, clothing, medical instruments, and laboratory specimens; ○ an infected animal (dead or alive). • Unprotected contact with semen from an individual recently recovered from Ebola disease. • A child exposed to breastmilk of an individual with Ebola disease.
Low Risk	• Adherence to recommended IPAC measures **AND** without known breach **AND** physical contact[4] with one or more of the following: ○ the body surface/mucous membranes of someone with symptomatic Ebola disease, the individual's body fluids, or dead body; ○ objects or surfaces that may be contaminated with orthoebolaviruses from the body fluids of someone with Ebola disease, including bedding, clothing, medical instruments, and laboratory specimens; ○ an infected animal (dead or alive).

[9] Due to the limitations of available evidence, uncertainties remain regarding the level, duration and type of protection provided by vaccinations. It is important to note that the individual risk assessment of contacts should not change based on vaccination status.

[10] Physical contact includes being in close proximity of an Ebola disease case, especially if the case is coughing, vomiting, bleeding externally or has diarrhea, based on a risk assessment.

	• Stayed in an Ebola disease-affected area but does not meet any of the criteria for a high-risk exposure.
No risk (not a contact)	• Do not meet any of the criteria above for high-risk or low-risk exposures: ○ not a household or sexual contact; ○ did not have any physical contact with someone with Ebola disease, their body fluids or dead body, or with objects or surfaces that could be contaminated by body fluids from someone with Ebola disease, or with an infected animal; and ○ did not stay in an Ebola disease-affected area. • The exposure occurred more than 21 days ago and therefore the incubation period for Ebola has passed.

Public Health Interventions

Table 5 outlines contact management based on risk. Also refer to Attachment—Summary of Contact Risk Assessment and Management.

Assessment

- Assess for exposure risk and symptoms.
  - Symptomatic contacts who have a high or low exposure risk (as defined in **Table 4**) are managed as a Case.
  - Individuals with no risk for exposure who develop symptoms should receive routine medical assessment and management.

Communication

- Contacts should be directly notified by Public Health.

Education

- Implement measures to reduce the risk of transmission to others should the contact become infected with Ebola disease by:
  - ensuring contacts are aware of their potential exposure;
  - discussing the importance of early symptom identification and any symptom monitoring expectations;
  - **assisting contacts to develop a plan to self isolate and to access health care if symptoms develop, including calling HealthLine 811 immediately;** and

- implementing other risk mitigation measures outlined in **Table 5**.

Isolation and Exclusion

- Asymptomatic contacts are managed based on exposure risk. See **Table 5**.
- A MHO may issue a Public Health Order to enforce quarantine requirements when there is a significant risk to the public.
- See Attachment—Summary of Contact Risk Assessment and Management

Immunization

- **In the event of an Ebola disease case, access to vaccines may be requested for post-exposure prophylaxis from PHAC's HPOC. Contact Ministry's HEMU via SHA HEM to initiate the Request for Assistance.**
- Two vaccines have been developed against Ebola virus and related viruses but neither are currently marketed in Canada and therefore are not widely accessible at this time.
  - The rVSV-ZEBOV-GP (Ervebo, Merck) is exclusively targeted at Ebola virus. Information on use for post-exposure prophylaxis is outlined in the Canadian Immunization Guide[11].
  - The prime-boost regimen Ad26.ZEBOV (Zabdeno) – MVA-BV-Filo (Mvabea) produced by Janssen, includes a prime vaccine targeted exclusively at Ebola virus, the booster vaccine contains antigens from 4 other viruses in the *Filoviridae* family (Ebola virus, Sudan virus, Taï Forest virus, and Marburg virus).

Testing

- Asymptomatic contacts do not require testing.
- Upon symptom identification, refer to Case Management.

[11] https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-4-active-vaccines/ebola-virus.html#a5.4

Table 5. Management of Asymptomatic Contacts based on Exposure Risk (PHAC, 2024)

Exposure Risk	Isolation Recommendations	General Recommendations
High-risk (as defined in Table 4)	**Do not have direct contact with others outside of the household**, including: • **Do not** attend work, school, or childcare facility • **Do not** attend public places (for example, do not attend , stores, funerals, religious gatherings, social events) except for seeking essential, non-elective medical care. • **Do not** travel on public/commercial conveyances (such as a bus, train, taxi, airplane) • **Do not** have visitors into the house. **Minimize or avoid direct contact where possible with those in their household**, including: • separate living spaces (e.g., bedrooms, bathrooms) and activities of daily living (e.g., dishes and laundry, done separately). • abstaining from sexual contact for the duration of the 21-day period • abstaining from breastfeeding for the duration of the 21-day period **Avoid all animal contact, if possible.** If animal contact can	**For High and Low risk asymptomatic contacts** **Inform contacts to contact HealthLine 811 immediately if they develop Ebola disease symptoms.** For 21 days following the last exposure to an orthoebolavirus: • Receive active public health monitoring for symptoms and counselling. The frequency and method of follow-up to be determined on a case-by-case basis following an initial assessment. • Self-monitor for symptoms of Ebola disease, including the documentation of oral temperature twice daily (AM and PM) and immediately if feeling chills/feverish. • Develop a plan to isolate and access healthcare if symptoms occur. • Avoid medications that lower fever (for example, acetaminophen, nonsteroidal anti-inflammatory medications) as they could mask early symptoms of Ebola disease. • Advise all healthcare providers, including paramedical services, of the potential Ebola disease exposure. • Postpone elective medical visits and procedures. • Do not donate blood, sperm and other body fluids, organs or tissue. • Maintain good infection prevention and control measures with regards to body fluids, regular cleaning of washrooms and good hand hygiene • Report any travel intentions outside of the public health jurisdiction to the public health authority. Travel outside the public health jurisdiction during the 21-day monitoring period requires careful consideration of risk and should not

	not be avoided, measures should be taken to reduce the chance that an animal would be considered exposed if the person develops symptoms. Consult with appropriate public health and animal health officials as necessary.	occur without prior discussion with, and agreement of public health authorities at the point of origin and the destination.
Low-risk (as defined in Table 4)	Essential activities can be maintained but direct contact and populated environments should be avoided.	
No risk (as defined in Table 4)	No restrictions	• Provide reassurance. • Provide education on Ebola disease, including modes of transmission

III. Environment

Health Care Facilities Control Measures

- Refer to SHA IPAC Ebola/VHF Toolkit.

Management of Deceased in the Community Setting[12]

Follow IPAC guidelines for handling deceased found in SHA IPAC Ebola/VHF Toolkit.

Per *The Disease Control Regulations*, bodies of deceased persons infected[13] with Ebola can be released to a funeral director only after consultation with, and following the instructions given, by a MHO.

- Ensure the body is isolated at site of death.
- Only trained personnel wearing recommended PPE should touch or move any human remains.

[12] All individuals who meet the case definition of PUI or confirmed case should be isolated and managed in a designated assessment site or treatment facility; therefore, the likelihood of death in the community setting is expected to low. However, having a plan to respond is important to avoid additional exposures and further transmission.

[13] If the deceased person is a high or low-risk exposure contact, a risk assessment by a MHO in consultation with an ID specialist is required, prior to release.

- Inform the funeral home director the deceased person has an Ebola virus infection.
- Confirm the funeral home has trained workers and required supplies to handle and transport the body as per *The Disease Control Regulations* and SHA guidelines in the IPAC Ebola/VHF Toolkit.
- Coordinate transportation of the body to the place of cremation with the hospital (if applicable), local transport provider, and funeral home in advance, to ensure the safety of all those involved in the process.
- Sensitively communicate to the family of the deceased that religious/ritual preparation of the body, washing, dressing, viewing, touching or kissing of the deceased are not allowed. Viewing of the body is not permitted.
- The body must be buried or cremated as soon as possible after death (within 48 hours), unless written permission to postpone burial or cremation has been obtained from a Medical Officer of Health. The body must not be accompanied by any contaminated articles. If the body is cremated, the ashes are not an infectious risk and can be released to the family.
- If the body is not destined for cremation, it must, at the earliest time possible after death, be enclosed in a coffin:
  - That is constructed of, or lined with, metal or other impervious material and is hermetically sealed, or
  - Which is placed in a tightly constructed outer container that is constructed of, or lined with, metal or other impervious material and that is hermetically sealed.
- A label stating the following should be attached immediately to the head of the coffin or to the outer container, whichever has been hermetically sealed.
  - PUBLIC HEALTH NOTICE: This body is or is suspected to be infected with a specified communicable disease and must be handled in accordance with *The Disease Control Regulations* under *The Public Health Act, 1994*.
    - Do not open the hermetically sealed container.
    - Do not remove this label.
- Ensure waste and linen in the home are disposed of appropriately. See PHAC guidelines Measures for the management of Ebola virus disease-associated waste and linen in home settings.

For additional considerations on handling deceased, see U.S. CDC Safe Handling of Human Remains of VHF Patients in U.S. Hospitals and Mortuaries.

Prevention Measures

Refer to the Respiratory and Direct Contact Introduction and General Considerations section of the manual that highlights topics for client education that should be considered as well as provides information on high-risk groups and activities.

Education (Committee to Advise on Tropical Medicine and Travel [CATMAT], 2024)
For all travellers to areas where Ebola is considered a hazard:

- practice frequent hand hygiene while abroad, either with soap and water, or with an alcohol-based hand rub.
- avoid close contact with live or dead animals, avoid handling raw or undercooked meat and avoid consuming wild game.
- condoms should be used during sexual activity with any new partners while abroad.
- people travelling to an Ebola-affected area for the purpose of visiting friends and relatives should exercise a degree of caution beyond that of typical tourist travellers, given that they often stay in local homes for a more prolonged period of time. They should be cautious of exposure to ill friends and relatives in a household setting and be aware of and adhere to safe burial practices.
- humanitarian aid workers should follow guidance provided by their organization.

For travellers returning from Ebola Disease affected areas[14]:

- Travellers should check the Public Health Agency of Canada's website for information on Ebola disease and what to do if they develop symptoms in the 21 days following their return to Canada.

As part of usual practice Canada Border Services Agency, personnel screen for ill passengers as per the *Quarantine Act*:

- When arriving in Canada, all travellers who are feeling unwell, must disclose to a Canadian Border Services Agent if they have been or suspect to have been in close proximity with someone who has a communicable disease, including Ebola.
- Symptomatic travellers will be referred to a Quarantine Officer for a health assessment.

[14] Defined by the World Health Organization as a region where there has been a confirmed locally acquired case of Ebola disease or where an individual with an infectious case of Ebola Disease has resided. Refer to https://www.who.int/emergencies/disease-outbreak-news

Immunization

Canadian's travelling to Ebola affected areas for international aid may inquire about vaccination through their host organization. Additional information on the Ebola virus vaccine is available in the Canadian Immunization Guide. [15]

Revisions

Date	Change
January 7, 2025	• NEW

[15] https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-4-active-vaccines/ebola-virus.html

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IMPORTANT:
Clinical judgement is essential for risk assessment and may result in risk assessment/ decisions that differ from these recommendations

No Risk of Exposure

Individual meets ONE of the following:

- They do not meet any of the criteria for high-risk or low-risk exposures; OR
- The exposure occurred more than 21 days ago and therefore the incubation period for Ebola has passed.

Any Ebola Disease Symptoms?

- NO → No further actions
  Provide reassurance and education, as needed
- YES → Routine medical assessment and maanagement

Low Risk of Exposure

Individual is not a household or sexual contact of a case but meets ONE of the following:

- Adherence to recommended IPAC measures
  AND
  without known breach
  AND
  physical contact[1] with one or more of the following:
  - the body surface/mucous membranes of someone with symptomatic Ebola disease, the individual's body fluids, or dead body;
  - objects or surfaces that may be contaminated with orthoebolaviruses from the body fluids of someone with Ebola disease, including bedding, clothing, medical instruments, and laboratory specimens;
  - an infected animal (dead or alive).
- Stayed in an Ebola disease-affected area but does not meet any of the criteria for a high-risk exposure.

Any Ebola Disease Symptoms?

- NO → See **Attachment**—Summary of Recommendations for Asymptomatic Contacts
- YES →
  - Manage as Person Under Investigation
  - **Rapid isolation and transport to designated assessment site**
  - Contact MHO/ID/ Microbiologist on-call

Initiate contact tracing **immediately**

High Risk of Exposure

Individual meets ONE of the following:

- All household and sexual contacts of a case
- Did not adhere to recommended infection prevention and control (IPAC) measures **OR** due to a breach in IPAC measures
  AND
  physical contact[1] with one or more of the following:
  - the body surface/mucous membranes of someone with symptomatic Ebola disease, the individual's body fluids, or dead body;
  - objects or surfaces that may be contaminated with orthoebolaviruses from the body fluids of someone with Ebola disease, including bedding, clothing, medical instruments, and laboratory specimens;
  - an infected animal (dead or alive).
- Unprotected contact with semen from an individual recently recovered from Ebola disease.
- A child exposed to breastmilk of an individual with Ebola disease.

Any Ebola Disease Symptoms?

- NO → See **Attachment**—Summary of Recommendations for Asymptomatic Contacts
- YES →
  - Manage as Person Under Investigation
  - **Rapid isolation and transport to designated assessment site**
  - Contact MHO/ID/ Microbiologist on call.

Initiate contact tracing **immediately**

[1] Physical contact includes being in close proximity of an Ebola disease case, especially if the case is coughing, vomiting, bleeding externally or has diarrhea.

Category of Asymptomatic Contact	**Recommendations to be followed for 21 days following last exposure.** For more details, refer to Table 5 in Part II Ebola virus and other related viruses (orthoebolaviruses)							
	General			**Restrictions**				
	Active Public Health Monitoring[16]	Self-Monitoring[17]	Other	Attendance at work/school/ childcare facility	Going out in public places	Household & animal contact	Use of public conveyances	Travel (outside Saskatchewan)[18]
High Risk	Yes- at least once daily	Yes- at least twice daily	See below	Restricted	Restricted (except for seeking essential, non-elective medical care)	**Household members:** minimize or avoid direct contact **Visitors:** Restricted **Animals (pets or livestock):** avoid direct contact	Restricted	Exceptional circumstances only. Consult MHO/ID for assessment.
Low Risk	Yes	Yes-at least twice daily	See below	Essential activities only. Direct contact and populated environments **must** be avoided. Consult MHO/ID for assessment.				
No Risk	No	No	Provide reassurance & education (as needed)	No	No	No	No	No
	Other general recommendations include: • Develop plan to self-isolate and access healthcare if symptoms develop, including calling HealthLine 811 immediately. • Avoid medications that lower fever (for example, acetaminophen, nonsteroidal anti-inflammatory medications) as they could mask early symptoms of Ebola disease. • Advise all healthcare providers, including paramedical services, of the potential Ebola disease exposure. • Postpone elective medical visits and procedures. • Do not donate blood, sperm and other body fluids, organs, or tissue. • Maintain good infection prevention and control measures with regards to body fluids, regular cleaning of washrooms and good hand hygiene							

Source: Public Health Agency of Canada. (2024). *Public health management of cases and contacts of Ebola disease in the community setting in Canada*. https://www.canada.ca/en/public-health/services/diseases/ebola/health-professionals-ebola/interim-guidance-public-health-management-cases-contacts-ebola-community-setting-canada.html

[16] Monitor for symptoms and provide counselling. Active monitoring is important for public health measure compliance and psychosocial support. The need for more frequent monitoring and the method of follow-up to be determined on a case-by-case basis following an initial assessment.

[17] Self-monitoring includes checking and documenting oral temperature twice daily and immediately with onset of fever/chills.

[18] For high-risk and low-risk contacts: Travel outside the public health jurisdiction during the 21-day monitoring period requires careful consideration of risk and should not occur without prior discussion with, and agreement of public health authorities at the point of origin and the destination. Do not travel on public/commercial conveyances (such as bus, train, taxi, airplane).