Ebola Disease

Background

Ebola disease (EBOD), a zoonosis caused by viruses in the genus orthoebolavirus, can cause a severe, acute viral hemorrhagic fever (VHF). First identified in 1976, EBOD typically occurs in tropical climates. Though the risk in Nova Scotia is considered very low, importation of EBOD to Canada may occur through a traveller connected to an outbreak elsewhere in the world. The purpose of this document is to describe the case and contact management of EBOD to rapidly detect and contain any further transmission of disease.

EBOD is reportable under the International Health Regulations. If Ebola disease is suspected or identified in Nova Scotia, the Chief Medical Officer of Health must be informed immediately.

If EBOD is suspected, this document should be used in conjunction with the Viral Hemorrhagic Fever Response Plan .

In the absence of more specific and technical guidance, this document may also be used for case and contact management of other VHFs with the potential for person-to-person transmission such as Lassa, Marburg, and Crimean Congo viruses.

For up-to-date information on outbreaks of concern occurring globally see:

- WHO Disease Outbreak News webpage.
- Public Health Agency of Canada Travel Health Advisories

Case Definitions

The case definitions for a confirmed case and person under investigation can be found here: Surveillance Guidelines.

Causative Agent

EBOD is caused by ribonucleic acid (RNA) orthoebolaviruses, which are members of the Filoviridae family. To date, there are six recognized species of orthoebolaviruses:

- Ebola virus *(species Orthoebolavirus zairense)*
- Sudan virus *(species Orthoebolavirus sudanense)*
- Taï Forest virus *(species Orthoebolavirus taiense)*
- Bundibugyo virus *(species Orthoebolavirus bundibugyoense)*
- Bombali virus *(species Orthoebolavirus bombaliense)*
  **not yet known if pathogenic to humans*

[1] *VHF Response Plan is a restricted access document developed and updated by the Department of Health and Wellness (DHW) that outlines the health system-wide coordinated processes and communication pathways in the event that a case of communicable (person-to-person transmission) VHF is suspected or identified in Nova Scotia.*

- *Reston virus (species Orthoebolavirus restonense)*
  **appears to be non-pathogenic to humans*

Source

Forest-dwelling fruit bats of the Pteropodidae family are the most likely natural reservoir of orthoebolavirus, although EBOD RNA has been detected in 3 bat species in Central Africa. Non-human primates (e.g., monkeys or gorillas) as well as infected forest antelope and porcupines have been identified as incidental hosts. One type of orthoebolavirus, Reston virus, was found in domestic swine from the Philippines in 2008 but is also believed to be an incidental host.

Transmission

EBOD is a zoonotic disease. Cases and outbreaks in humans often occur through initial exposure to either the reservoir population or an intermediate infected host (e.g., non-human primates), with subsequent person-to-person transmission.

Animal-to-human:

- direct contact with infected animals (live or dead) or their body fluids (e.g. handling, preparing or eating raw or undercooked bushmeat), including fruit bats, primates, porcupines, forest antelope, and pigs in endemic areas.

Person-to-person transmission can occur through:

- direct contact (through non-intact skin or mucous membranes) with blood and/or other body fluids (e.g., feces, urine, emesis, saliva, sweat, breast/chestmilk, semen) from an infected symptomatic person or deceased body
- indirect contact with surfaces and fomites contaminated with these fluids (e.g. bedding, clothing, needles). Orthoebolavirus may remain viable on surfaces and in liquids for several days, dependent on other environmental factors.
- vertical transmission during pregnancy, breast/chest feeding and/or delivery

Airborne transmission is not a known mode of spread.

Communicability

Before symptom onset, communicability is negligible and is considered highest when a person is acutely unwell with symptoms such as diarrhea and vomiting. Blood, feces, and emesis are believed to be the most infectious body fluids.

Cases remain communicable as long as blood and body fluids contain the virus, including in the post-mortem period. Even during clinical recovery, convalescent cases may still be communicable as virus can persist for weeks to months in certain tissues and body fluids (e.g. semen and milk from breast/chestfeeding, cerebrospinal fluid, eyes, placenta).

Figure 1: EBOD Illness Spectrum and Communicability

	Incubation Period	Early illness symptoms	Mid illness symptoms	Later illness symptoms
Time	2-21 days	0-3 days	3-10 days	7-12 days
Symptoms	No symptoms	Fever Fatigue Headache Sore throat	Diarrhea Vomiting Stomach Pain Hiccups	Severe diarrhea Severe vomiting Hemorrhage
Infectivity				
Risk of spread by body fluids	**Negligible**	**Low**	**Moderate to High**	**Very High**

Clinical course may not progress exactly as depicted. Figured adapted from [GOV.UK (2023) Ebola: Overview, history, origins and transmission]

Incubation

Incubation period ranges between 2 and 21 days, with most cases experiencing symptom onset 4 to 10 days after exposure.

Clinical Presentation

Symptoms usually begin with a sudden onset of non-specific symptoms such as:

- fever (>38 °C)
- myalgia
- headache
- malaise
- sore throat
- cough

Followed later in illness by:

- severe nausea and vomiting
- severe diarrhea (that can be bloody)
- abdominal discomfort

- hiccups
- dysphagia
- hemorrhage
- maculopapular rash
- conjunctival redness
- jaundice
- confusion

Diarrhea and vomiting are often profuse in later stages of the illness and without supportive care lead to severe volume depletion, electrolyte abnormalities, dehydration and shock. Hiccups and dysphagia are also often present later in illness. Hemorrhage may occur as a late manifestation (less than 10% of cases) usually through venipuncture sites, the gastrointestinal tract (e.g. stool) or other mucosa (e.g. gums) which can lead to secondary bacterial infections.

The clinical course of EBOD is severe and often fatal. Past outbreaks have seen case fatality rates (CFR) ranging from 25% to 90%.

Non-fatal cases often have fever for several days and typically begin improving around day 6 to 11. Full recovery occurs over a long period of time and is often associated with long-term sequelae such as myelitis, recurrent hepatitis, psychosis, uveitis, and mental health issues.

Diagnostic Testing

The gold standard for confirmatory testing for EBOD is identification of viral RNA using reverse transcription Polymerase Chain Reaction (RT-PCR) that uses two independent molecular targets or two independent samples. Other diagnostic methods that can be used to confirm a case are outlined in Public Health Agency of Canada's (PHAC) Ebola disease case definition.

If EBOD is suspected, the Regional Medical Officer of Health (RMOH) on call will be immediately notified. Refer to the Viral Hemorrhagic Fever (VHF) Response Plan for full details.

Laboratory testing requests and specimen collection

EBOD testing can only be done at designated laboratories in Nova Scotia unless otherwise directed. All persons under investigation and confirmed cases will be tested and receive care either at the QEII Health Sciences Centre VG Site or the IWK Health Centre (if pediatric). EBOD testing for pediatric patients will take place at the IWK Health Centre with samples transported by a specialized team to the QEII. All other laboratory tests should not be completed without a discussion with the RMOH and microbiologist to both protect laboratory staff and prevent potential contamination of laboratory testing equipment. All specimens will be sent to the National Microbiology Laboratory (NML) for confirmatory testing.

Shipping

The Provincial Public Health Laboratory Network (PPHLN) will coordinate with the NML to ensure sample requirements, sample shipping conditions, and any other processes are followed accurately and appropriately. Any transportation of specimens between facilities is done as per the Transportation of Dangerous Goods (TDG) Regulations for Category A specimens and by an individual currently certified for TDG Clear Language Regulations.

Impact of vaccination on diagnostic testing

Vaccination with rVSV-ZEBOV, and other EBOD vaccines, can impact testing. For additional information see Nova Scotia Surveillance Guidelines for Notifiable Disease and Conditions for Ebola. It is important to include information on recent vaccination with the rVSV-ZEBOV vaccine or other approved Ebola Vaccines on the requisition. A list of globally approved Ebola vaccines can be found at WHO Ebola virus disease: Vaccines.

Treatment

Treatment is outside the scope of Public Health. There is currently no Health Canada approved treatment for EBOD. Supportive care is essential and must be overseen by clinical specialists and under strict infection prevention and control and occupational health and safety management. Early initiation of supportive care has been found to significantly reduce the likelihood of death.

Several investigational therapeutics, including antivirals and monoclonal antibodies, are currently under development. If the investigational products are required, the Nova Scotia Department of Health and Wellness Public Health will support access to the treatment product. Additional information regarding investigational therapeutics for Ebola disease is available at Ebola disease: For health professionals, humanitarian aid workers - Canada.ca

Public Health Management and Control

Case Management

Management of a person under investigation (PUI)

Upon notification of a possible EBOD, the RMOH will initiate an investigation, including but not limited to review of symptom onset, clinical status, travel history, and other epidemiological risk factors. Clinical judgement remains essential for assessing the individual's risk of exposure and determining index of suspicion for EBOD particularly when the case is not a previously known contact and/or exposure occurred outside Canada (i.e., returning travelers). If EBOD is plausible, then the RMOH will activate the VHF Response Plan to consult with clinicians and coordinate a plan for the PUI across the health system.

Public Health follow-up of suspected EBOD is a priority and the following steps must be taken immediately.

Infection prevention and control measures

- Regardless of symptomology or clinical status, all PUIs **must** be admitted and placed under isolation and IPC precautions at the QEII Health Sciences Centre VG Site or IWK Health Centre (if pediatric) unless otherwise directed by the RMOH (in consultation with the Emerging and Re-emerging Infectious Network (ERIN)) until EBOD has been ruled out through diagnostic testing 72 hours or more after symptom onset.
- No exclusions apply as care and isolation occur in the hospital.

Contact Tracing

- Refer to Contact Management.

Public Health Follow Up

- Complete the Case Report Form with as much detail as possible at the time of initial report. Updates can be made when information becomes available. Refer to Surveillance Guidelines.
- Active daily monitoring until EBOD has been appropriately ruled out. Liaise with appointed hospital staff for monitoring of disease progress.
- If medical assessment and laboratory investigations rule out EBOD and clinical status does not require hospitalization, client may return home but must continue to be under active monitoring by Public Health for 21-days from last exposure and follow public health measures per exposure risk assessment. See Contact Management.
- Additional public health measures may be determined on a case-by-case basis.

Management of a Confirmed Case

Upon notification of a confirmed case of EBOD, RMOH will activate VHF Response Plan, if not already activated, and coordinate with clinical specialists to arrange for any further medical assessment including symptom onset, clinical status, travel and/or exposure history. Follow-up of EBOD is a priority and the following steps must be taken immediately:

Infection prevention and control measures

- All cases must be admitted and placed under isolation and IPC precautions at the QEII Health Sciences Centre VG Site or IWK Health Centre (if pediatric) unless otherwise directed by the RMOH (in consultation with ERIN).
- Though it is unlikely a confirmed case will be identified in a community setting, see Table 1 for isolation and IPAC measures direction based on case location at time of notification.
- No exclusions apply as care and isolation occurs in hospital.

Contact Tracing

- **Rapid identification and assessment of contacts is required, including the need for immunoprophylaxis where applicable. See Contact Management.**

- If the case works, volunteers, or resides in a health care setting, collaborate with OHSW and IPC to investigate potential exposures and/or acquisitions within the health care setting.

Public Health Follow-Up

- Complete the Case Report Form with as much detail as possible at the time of initial report. Updates can be made when information becomes available. Refer to Surveillance Guidelines.
- Active daily monitoring is required. Liaise with appointed hospital staff for the duration of acute illness to monitor disease progress and prepare for discharge.
- The decision to discharge and/or discontinue isolation should be made jointly in consultation with the clinical specialist and Public Health and managed on a case-by-case basis taking into consideration both clinical status and infectiousness risk.

  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.

Table 1: Infection Prevention and Control Measures and Isolation Requirements for PUIs and Confirmed Cases

Community *(e.g., a contact becomes symptomatic at home)*	Self-isolate while awaiting EHS transport (provide education as per Table 3: Public Health Measures for Contacts Table under Contingency Plan section).Notify 911 operator/emergency services and all healthcare providers of potential Ebola disease, unless otherwise notified through the VHF response plan activation.
Hospital *(e.g., a symptomatic traveller presents in an emergency department)*	Isolation and IPC policies and protocols should be initiated immediately and should stay in place until the case is considered non-infectious.
In the event of a death, the deceased should remain isolated and the Nova Scotia Medical Examiner Service (NSMES) contacted at 902-424-2722 to coordinate the disposition of patient fatalities, including deaths in health care facilities.	

Convalescent Case

Orthoebolavirus can persist in immunologically privileged sites and consequently semen, milk from breast/chestfeeding, aqueous humor, cerebrospinal fluid may contain virus after the case has recovered. For Ebola virus infection developed during pregnancy the fetus, amniotic fluid, or placenta may contain the virus, even once the case has recovered. Whether and for how long the virus is present in these privileged sites is variable. As such, there is a risk that individuals exposed to those fluids could become infected. See Table 2: Public Health Measures for Convalescent Cases.

Education

Counseling should be provided to **all** convalescent cases in collaboration with clinical specialists and include the following:

- Instructions regarding any follow-up appointments required.
- Instructions regarding possible communicability and ways to prevent transmission.
- Common sequelae and potential complications (e.g., fatigue, joint pain, muscle aches, sexual dysfunction).
- Psychosocial supports and resources.
- Signs and symptoms for when to seek medical attention, including new onset of fever, uveitis (ocular manifestation), headache, neck stiffness, photophobia, altered mental status, and/or seizures as these symptoms may be suggestive of a rare but potential disease relapse.
- Provide education regarding ongoing risk of communicability and how to prevent potential transmission to others. See Table 2: Public Health Measures for Convalescent Cases.
- Recommendation to delay elective procedures on areas of the body with potentially persistent orthoebolavirus infection (e.g. eyes, central nervous system) if applicable.
- Donation of blood, tissue, sperm, or gamete donation should not occur without discussion with the RMOH and clinical specialists.

Public Health Follow-Up

- **In circumstances where the convalescent case has testes, is pregnant, or is planning to resume breast/chestfeeding, continued Public Health monitoring of the individual is required due to increased risk of ongoing communicability.** All other convalescent cases will not require Public Health follow up following discharge unless otherwise directed by the RMOH.
- Any additional public health recommendations on a case-by-case basis, e.g., exclusion from sensitive work environments.
- When a convalescent case's body fluids are considered free of the virus the individual may be considered no longer a risk to public health and Public Health follow-up discontinued.

Table 2: Public Health Measures for Convalescent Cases

	Public Health Measures for Home and Community
Semen	• Abstinence or safe sexual practices through correct and consistent condom use until semen confirmed negative for orthoebolavirus or if testing not done then for at least 12 months after onset of symptoms. o Semen should be tested at 3 months after symptom onset and, if positive, re-tested every month until semen is confirmed negative for orthoebolaviruses through RT-PCR testing of two consecutive samples done at least one week apart. • Practice good personal hygiene, including immediately and thoroughly performing hand hygiene with soap and water after any physical contact with semen. • A plan for waste management of contaminated materials (e.g., used condoms) should be developed with IPC professionals or other trained personnel.
Breast/ chestfeeding	• Breast/chestfeeding should not resume until the milk from breast/ chestfeeding is confirmed negative for orthoebolaviruses through RT-PCR testing of two consecutive samples obtained at least 24 hours apart. • Consultation with clinical specialists may be needed to develop a plan for re-establishing breastmilk supply and/or feeding as it **is not recommended to attempt to maintain lactation by pumping and discarding the milk from breast/chestfeeding**. • Practice good personal hygiene including immediately and thoroughly performing hand hygiene with soap and water after any physical contact with the milk from breast/chestfeeding. • A plan for waste management of contaminated materials should be developed with IPC professionals or other trained personnel.
Labour and delivery	• If a pregnant person is in the convalescent period, appropriate IPC precautions are needed for labour and delivery, including handling of the newborn and placenta. • A plan for labour and delivery should be developed in consultation with clinical specialists. • There is no evidence to show that women who survive EBOD and subsequently become pregnant pose a risk for Ebola virus transmission in that pregnancy.

	Public Health Measures for Home and Community
For information regarding environmental cleaning, disinfecting, and waste management see: • PHAC's Measures for the management of Ebola virus disease-associated waste and linen in home settings • Or consult with the RMOH, who will lead any referral to the Department of Environment and Climate Change (ECC) for Public Health Inspection.	

Note: *Orthoebolavirus has been detected in other body fluids of convalescent cases; however, such evidence is limited, and majority of available data has been derived from individual case studies. There is currently little evidence of secondary transmission from convalescent cases following discharge from hospital, apart from sexual transmission through infectious semen. Additionally, PCR positivity does not always indicate presence of infectious virus, as it may be that residual RNA is being cleared and this is supported by a small number of studies which have found negative cultures on PCR-positive specimens. More information is needed to make informed public health recommendations. At this time, case-by-case assessment is needed when determining IPC precautions in circumstances for potential exposure to a convalescent case's bodily fluids. However, orthoebolavirus-specific IPC measures may still be needed in circumstances involving immunologically privileged areas of the body where orthoebolavirus infection may continue to persist (e.g., clinical interventions involving aqueous humor of the eye, cerebral spinal fluid).*

For more information and data regarding Orthoebolavirus persistence see: Caring for Ebola Disease Survivors in the U.S. | Ebola | CDC.

Contact Management

A contact is defined as an asymptomatic person who has been or may have been exposed to orthoebolavirus in the past 21 days.

The goals of contact management are early identification of symptoms and disease onset; prompt clinical assessment and testing; initiation of appropriate and supportive care which has been found to reduce risk of death; reduced risk of transmission to others; and, when indicated, timely provision of post-exposure immunoprophylaxis.

- As EBOD is a potentially life-threatening disease, all contacts of **confirmed cases** must be rapidly identified and assessed.
- For contacts of a **PUI**, the RMOH should determine extent of contact management based on the epidemiological and clinical information provided (i.e. index of suspicion that a PUI will have EBOD). At minimum, names and contact information should be collected. The level of monitoring and public health intervention should be based on risk.

Contacts must have an Exposure Risk Assessment per the criteria below to determine their risk of exposure and the appropriate public health recommendations. As above, clinical judgement remains essential for assessing the individual's risk of exposure. Travelers returning from EBOD-affected areas should be assessed using the same criteria below. **Vaccination status does not impact or change the risk assessment**.

High-Risk Exposure:

- All household contacts.
- Physical contact, **without** adhering to recommended IPC precautions or due to a breach in IPC precautions, with any of the following:
  - the non-intact skin/mucous membranes of a symptomatic case, their body fluids, their dead body, or
  - objects or surfaces that may be contaminated with orthoebolavirus including medical instruments, bedding, clothing, laboratory specimens, or
  - an infected animal (dead or alive)
- Unprotected sexual contact with an acute case or unprotected contact with the semen of a convalescent case.
- Physical contact, without adhering to recommended IPC precautions, with the milk from breast/chestfeeding of an acute or convalescent case.

Low-Risk Exposure:

- Physical contact, **while** adhering to recommended IPC precautions and no known breach in IPC precautions, with any of the following:
  - the non-intact skin/mucous membranes of a symptomatic case their body fluids, their dead body, or
  - objects or surfaces that may be contaminated with orthoebolavirus including medical instruments, bedding, clothing, laboratory specimens, or
  - an infected animal (dead or alive), or
  - any other known source of orthoebolavirus (e.g., including contaminated medical instruments or environmental surfaces)
- Had only brief interactions, and no direct contact, with an EBOD case or their body fluids (e.g., casual interactions include sharing a seating area on public transportation, sitting in the same waiting room).
- Stayed in a EBOD-affected area (see Surveillance Guidelines for definition) but does not meet any of the criteria for high-risk exposure.

Public Health, Infection Protection and Control (IPC), and Occupational Health and Wellness (OHSW) Specialist should collaborate and refer to appropriate NSH IPC policy and protocols when assessing risk level of contacts with exposures in health care settings. For more information see Public Health Agency of Canada's Infection Prevention and Control Measures for Ebola Virus Disease in Healthcare Settings.

Public Health Management of Contacts:

- Obtain names and information for contacts who meet definition as above.
- Promptly notify contacts of potential exposure and perform an exposure risk assessment including assessing for any current symptoms compatible with EBOD.
    - o If contact reports symptoms, initiate PUI Case Management above. If first to know, IPC and/or OHSW must notify Public Health immediately.
- If the contact was exposed in a health care setting as a health care worker or in-patient, contact management is done in collaboration with OHSW and IPC.
- Provide education on public health measures, exclusions, and active daily monitoring of temperature and symptoms for 21 days following the last possible exposure as per Table 3: Public Health Measures for Contacts.
    - o Undue hardship as a result of required or recommended Public Health measures should be minimized where possible and supports made available on a case-by-case basis.

Table 3: Public Health Measures for Contacts

Public Health Measures for 21-Days Following Last Possible Exposure	**Education**	Asymptomatic contacts with a **low risk** of exposure	Asymptomatic contacts with a **high risk** of exposure
Active Monitoring	Importance and reasoning for active monitoring and establishing a client-centred plan such as frequency, method (e.g. text with intermittent calling), and time of day to reach client. This may vary based on risk. How to reach local public health at anytime of day or night. If contact was exposed in a health care setting as a health care worker or in-patient, OHSW and/or IPC may lead active monitoring. Refer to NSH documents for specific details.	✔	✔
Symptom monitoring	Self-monitor for symptoms compatible with Ebola disease and report symptom onset immediately to local public health and initiate contingency plan	✔	✔
Temperature checks	Check and document oral temperature twice daily (a.m. and p.m.) and immediately if they start feeling chills/feverish. If necessary, provide education on how to use a thermometer accurately.	✔	✔

Public Health Measures for 21-Days Following Last Possible Exposure	Education	Asymptomatic contacts with a **low risk** of exposure	Asymptomatic contacts with a **high risk** of exposure
Temperature checks	Report temperature >38°C and/or subjective fever immediately to local public health and initiate contingency plan.	✔	✔
Contingency plan	Develop a contingency plan that can be **immediately** initiated in the event of symptom onset or temperature >38°C. Contingency plan should include: • Notify local public health. • If emergency services are required, advise operator and all healthcare providers of exposure to EBOD. • Self-isolate in a separate room. Maintain 2-metre distance from others, including pets. • Immediately and thoroughly perform hand hygiene with soap and water after toileting, vomiting, or any contact with bodily fluids. Where possible use a separate bathroom or disinfect shared bathroom after use. • Ensure others do not come in contact with blood or bodily fluids (e.g., blood, emesis, feces, urine, milk from breast/chestfeeding) or in contact with items potentially contaminated with blood or bodily fluids (e.g., clothing, linens). • If unable to effectively self-isolate (e.g., parent of a young child), maintain as much physical distance as possible, perform hand hygiene with soap and water, and apply additional precautions (e.g., personal protective equipment (PPE)). • Arrangements must be made for professional management of EBOD-associated waste and environmental cleaning.	✔	✔
Antipyretics	Avoid medications that are known to lower fever (e.g., acetaminophen, ibuprofen, acetylsalicylic acid) as these medications can mask an early symptom of EBOD. If taken, advise local public health.	✔	✔

Public Health Measures for 21-Days Following Last Possible Exposure	**Education**	Asymptomatic contacts with a **low risk** of exposure	Asymptomatic contacts with a **high risk** of exposure
Travel restrictions	Report any travel intentions outside of the local public health jurisdiction to local public health for careful consideration of risk and approval.	✔	✔
Medical visits/ procedures	Advise all healthcare providers (e.g., EHS, healthcare providers, dentists) of their potential exposure. Postpone elective medical visits and/or other elective procedures (e.g., elective dental visits, elective blood tests).	✔	✔
Donation of blood, tissues, semen	Refrain from donating blood, sperm, and any other body fluid or tissue until cleared and/or EBOD ruled out.	✔	✔
Infection prevention and control	Maintain good hand hygiene practices and use hand hygiene after direct contact with bodily fluids (e.g., respiratory secretions, stool).	✔	✔
Cleaning and disinfecting	Clean and disinfect frequently touched surfaces, particularly in bathrooms every day. This may include doorknobs, light switches, toilets, and countertops, faucets, etc. Refer to below Resources for information on environmental cleaning and handling of waste in community settings or contact Nova Scotia Department of Environment and Climate Change or IPC professionals.	✔	✔
Contact with others in household	Minimize or avoid direct contact with others in household, where possible, including abstaining from sexual contact.		✔
Contact with others outside the household	Restrict activities to minimize exposure to others: • Must not attend public places (e.g., religious congregation, wedding, funeral, social events, work, school, or daycare) except when seeking essential medical care.	Essential activities may be maintained but should avoid direct contact with others and populated	✔

Public Health Measures for 21-Days Following Last Possible Exposure	Education	Asymptomatic contacts with a **low risk** of exposure	Asymptomatic contacts with a **high risk** of exposure
Contact with others outside the household	• Medical care personnel must be notified about the exposure risk to Ebola virus prior to seeking medical care. • No visitors to the home. • Do not travel on public or commercial conveyances (e.g., bus, train, taxi, airplane). • **Regardless of risk assessment, those who work in health care settings must also consult with their OHSW for further direction**. If there are concerns around public safety, quarantine may be required by order of the RMOH.	environments where direct contact is likely A case-by-case assessment will be needed to determine exclusions and recommendations. Medical care personnel must be notified about the exposure risk to Orthoebolavirus prior to seeking medical care.	✔
Contact with animals	Avoid all animal contact, if possible. If animal contact cannot be avoided, measures should be taken to reduce potential exposure (e.g., wearing appropriate PPE).		✔
Breast/ chestfeeding	It is recommended that contacts do not breast/chestfeed or provide expressed milk from breast/chestfeeding for 21-days post exposure. If the contact is planning to continue breast/ chestfeeding after the 21-days post exposure then milk can be expressed to maintain supply, however, the milk should not be given to the infant. The contact should follow good hand and personal hygiene by immediately and thoroughly washing with soap and water after any physical contact with the milk from breast/ chestfeeding. Handling, containing, and storing expressed milk from breast/chestfeeding in a community setting should be discussed with IPC professionals or trained personnel.	Discuss and provide information regarding the relative risks and benefits of continued breast/ chestfeeding.	

Public Health Measures for 21-Days Following Last Possible Exposure	Education	Asymptomatic contacts with a **low risk** of exposure	Asymptomatic contacts with a **high risk** of exposure
Other	If possible, remain near an acute care facility (within one hour's drive to facilitate rapid transfer to the facility) where medical care with appropriate IPC measures can be implemented.		✔

Immunoprophylaxis

Ebola Zaire vaccine, Ervebo (EZV) for the Zaire species[2] is approved by Health Canada. Ervebo is not currently available or recommended for Canadians as part of routine immunizations or vaccinations prior to travel. A limited quantity is available through Canada's National Emergency Strategic Stockpile (NESS) for the management of exposures to cases detected in Canada and management of potential outbreaks. If the federal stock of investigational products is required, the Department of Health and Wellness will access the treatment product.

Post-exposure immunization

When indicated, post-exposure immunization with Ebola Zaire vaccine, Ervebo (EZV), be administered as early as possible, ideally within 72 hours of exposure. It may still be of benefit up to 10 days post-exposure to Ebola virus (*orthoebolavirus zairense*). For previously immunized individuals, EZV may be considered if the vaccine was received more than 18 months prior to the current exposure. Ervebo is a live attenuated virus (vesiculostomatitis virus vector) vaccine.

- A single dose of EZV should be offered as post-exposure immunization for asymptomatic contacts with high-risk exposure to Ebola virus (*orthoebolavirus zairense*) who are non-pregnant and immunocompetent.
- A single dose of EZV can be considered after a risk assessment in consultation with an RMOH and other experts for other populations:
    - Infants, children, or adolescents
    - Pregnant and/or breast/chestfeeding persons
    - Immunocompromised persons.

To request access to EZV the RMOH will refer to DHW's Public Health Emergency Preparedness Process Reference Document for details. If the federal stock of Ebola virus vaccine is required, the Department of Health and Wellness will access the vaccine product.

[2] *EZV is not indicated for use against other ebolaviruses, such as Sudan virus or Bundibygyo virus, or related filoviruses, such as Marburg virus.*

Please refer to the Canadian Immunization Guide for additional details, including vaccination and counselling of special populations, dosing and administration practices, timing, and reimmunization.

Pre-exposure immunization

- Pre-exposure immunization may be considered for non-pregnant, immunocompetent adults in exceptional circumstances after consultation with infectious diseases and an RMOH, when a dedicated team of healthcare workers is anticipated to provide direct care for a person with confirmed, symptomatic EBOD in the province.
- Pregnant and immunocompromised persons should avoid providing health care to persons with confirmed EBOD.

Individuals travelling to EBOD-affected areas through humanitarian organizations should enquire within their host organization about the availability of EZV.

Resources

Public Health Management:

- Public Health Agency of Canada: Public Health Management of Cases and Contacts of Ebola Virus Disease in the Community Setting in Canada
- Public Health Agency of Canada: Ebola virus disease: For health professionals and humanitarian aid workers
- British Columbia centre for Disease Control: Ebola Virus Disease Contact Investigation and Management Guidelines
- UK Health Security Agency: Ebola: Overview, history, origins and transmission.
- Additional PHAC tools *(not required)* Contact Tracing Form, Contact Monitoring Form, Temperature Recording Form

Infection Prevention and Control

- WHO Infection prevention and control guideline for Ebola and Marburg disease
- Measures for the management of Ebola virus disease-associated waste and linen in home settings - Canada.ca
- Infection Prevention and Control Measures for Ebola Virus Disease in Healthcare Settings – Canada.ca
- Guide to Infection Prevention and Control (IPAC) Management of Suspected or Confirmed Viral Haemorrhagic Fever (VHF) in Acute Care (publichealthontario.ca) – Refer to Table 1 for General Epidemiologic Features of Selected Viral Haemorrhagic Fever Agents

Border and Travel

- Committee to Advise on Tropical Medicine and Travel (CATMAT): Ebola Virus Disease Prevention, Monitoring and Surveillance Recommendations
- Travel health notices

Immunization

- Ebola virus vaccine: Canadian Immunization Guide
- National Advisory Committee on Immunization Interim Statement on the Use of the rVSVΔG-ZEBOV-GP Vaccine for the Prevention of Ebola Virus Disease
- Ervebo Product Monograph Merck Canada
- Sudan Ebolavirus Vaccine Tracker - List of vaccine candidates in research & development

Ebola Convalescence:

- WHO's Clinical Care for Survivors of Ebola Virus Disease
- PHAC Public Health Management of Cases and Contacts of Ebola Virus Disease in the Community Setting in Canda: Convalescent Cases

- Caring for Ebola Disease Survivors in the U.S. | Ebola | CDC
- Management of Ebola virus disease (EVD) survivors in Ontario

Pregnancy and Breastfeeding:

- Clinical Guidance for Neonates Born to Patients with Suspected or Confirmed Ebola Disease | Ebola | CDC
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