Mpox (Orthopoxvirus) Infection

Manitoba
Public Health Branch

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Summary of Updates

January 21, 2024

- The term “monkeypox” to “mpox” updated throughout the document to align with the World Health’s Organization’s preferred nomenclature for this disease.
- Update re: Mpx no longer considered a PHEIC by WHO. – pg. 3
- Update to the communicability period to include pre-symptomatic transmission (4 days prior to symptom onset) based on recent evidence. – pg. 6
- Additional information added for exposures to animals and monitoring post-exposure. – pg. 9-10
- Information added to provide guidance to assist with risk assessments for contacts identified in the pre-symptomatic period. – pg. 13-16
- Updated information for immunization to support emerging evidence of better preventative protection with 2 doses for pre-exposure prophylaxis. – pg. 19-20

August 26, 2022

- Updates to isolation instructions for cases. Added recommendation for condom use for 12 weeks after being deemed no longer contagious– pg. 8-10
- Updates to exposure risk assessment for contacts, and contact education – pg. 14-19
- Added prevention measures - pg. 20
- Clarifications to public health documentation guidelines – pg. 21-24

1. Etiology and Background

Mpox, formerly known as monkeypox is a disease caused by infection with the mpox virus, a member of the Orthopoxvirus genus which includes smallpox (variola) virus, vaccinia virus and cowpox virus. The virus is endemic to parts of Central and West Africa.

Mpox infection is spread through contact with an infected animal or person. Transmission from human to human has been uncommon in previous outbreaks.

There are two distinct genetic clades of the mpox virus: Clade I (formerly the central African clade) and Clade II (formerly the West African clade). Clade II mpox is associated with milder disease, fewer deaths, and limited human-to-human transmission. Human infections with the Clade I mpox virus are typically more severe compared to those with the Clade II and have a higher mortality.

In May 2022, emerging cases of mpox were identified in several non-endemic countries, including Canada. Many of the global cases identified to date have reported close, intimate contact, or sexual contact with anonymous partners such as at a bar or party. Although this virus is not known to be a sexually transmitted infection, close intimate contact during sex is known to be a risk factor, and the lesions may start and be localized to the sites of contact (e.g., genital lesions).

On July 23, 2022, the World Health Organization (WHO) declared the global mpox outbreak a public health emergency of international concern (PHEIC). In May 2023, WHO announced the outbreak no longer a PHEIC, but emphasized the importance for a long-term response plan. This protocol was developed and is updated based on guidelines available from public health organizations, including the Public Health Agency of Canada (PHAC), the United States Centers for Disease Control and Prevention (CDC), the United Kingdom Health Security Agency (UKHSA), and the World Health Organization (WHO).

The objectives of this guidance are for containment of the virus to rapidly stop chains of transmission and prevent endemicity of the virus.

2. Case Definitions

2.1 Confirmed Case

A person who is laboratory confirmed for mpox virus by detection of unique sequences of viral DNA either by real-time polymerase chain reaction (PCR) and/or sequencing.

2.2 Probable Case

A person of any age who presents with an unexplained[1] acute rash or lesion(s)[2], AND

Has one or more of the following:

1. An epidemiological link to a probable or confirmed mpox case in the 21 days before symptom onset, such as:
    - Face-to-face exposure, including health workers without appropriate personal protective equipment (PPE).
    - Direct physical contact, including sexual contact; or contact with contaminated materials such as clothing or bedding.
2. Reported travel history to, or residence in, a location where mpox is reported[3] in the 21 days before symptom onset.

2.3 Suspect Case

A person of any age who presents with one or more of the following:

1. An unexplained[1] acute rash[2] AND has at least one of the following signs or symptoms
    - Headache
    - Acute onset of fever (>38.5°C),
    - Lymphadenopathy (swollen lymph nodes)
    - Myalgia (muscle and body aches)
    - Back pain
    - Asthenia (profound weakness)

2. An unexplained[1] acute genital, perianal or oral lesion(s)

[1] ***Common causes of acute rash*** can include varicella zoster, herpes zoster, measles, herpes simplex, syphilis, chancroid, lymphogranuloma venereum and hand-foot-and-mouth disease.

[2] ***Acute rash***

Mpox illness includes a progressively developing rash that usually starts on the face and then spreads elsewhere on the body. The rash can affect the mucous membranes in the mouth, tongue, and genitalia. The rash can also affect the palms of hands and soles of the feet. The rash can last for 2 to 4 weeks and progresses through the following stages before falling off: macules, papules, vesicles, pustules, scabs.

N.B. It is not necessary to obtain negative laboratory results for listed common causes of rash illness in order to classify a case as suspect.

[3] Reported travel history includes regional, national, or international travel in the 21 days before symptom onset to any area where mpox may be reported. https://www.who.int/emergencies/emergency-events/item/2022-e000121

3. Reporting Requirements

3.1 Laboratory

All positive laboratory results for an Orthopoxvirus should be reported by the laboratory to the Manitoba Health Surveillance Unit by confidential fax 204-948-3044 or electronic transfer.

3.2 Health care providers

Individuals that meet the surveillance case definitions for a suspect or probable case, or self-identify as a high or intermediate risk contact to a known case should be reported by health care providers to the Manitoba Health Surveillance Unit though the clinical notification form: https://www.gov.mb.ca/health/publichealth/cdc/protocol/mhsu_0013.pdf

Individuals who meet a suspect or probable case definition should be advised by their health care provider to isolate at home until the diagnosis is confirmed, or an alternate diagnosis is made. Public health reporting and follow-up for suspect cases or probable cases is generally not required until test results are available. However, in situations in which the index of suspicion for mpox for the suspect case is very high or with a delay in laboratory results is anticipated, public health reporting and follow-up can be initiated, pending the results of laboratory testing.

4. Epidemiology

4.1 Reservoir

The natural reservoir of mpox remains uncertain (1). In Africa, evidence of mpox virus infection has been found in many animals including rodents and non-human primates (like monkeys) (2)

4.2 Transmission

Mpox is transmitted when a person comes into close or direct contact with an infected animal, human or contaminated objects (3). Historically, human to human transmission is uncommon. Transmission occurs through:

- Direct contact with skin lesions,
- Direct contact with blood or body fluids (note: evidence around sexual transmission is emerging),
- Indirect contact with contaminated objects, including clothing and linen (bedding or towels) or soiled bandages, and
- Respiratory droplets.

Prolonged face-to-face contact is generally required for transmission via respiratory droplets. Household members, health care workers and close contacts to active cases are at the greatest risk.

Mpox may also be transmitted vertically, from mother to fetus and can result in congenital mpox. Limited data on mpox infection in pregnancy is available, with some interim recommendations published in other jurisdictions (4, 5).

4.3 Occurrence

Outside of endemic regions of Central and West Africa, mpox infections have typically been linked to international travel or handling of imported animals from these regions. However, during the global outbreak in May 2022, evidence of human to human transmission in many non-endemic countries in Europe, Australia and the Americas has been reported (3, 6).

4.4 Incubation Period

The interval from infection to symptom onset may range from 5 to 21 days; averages 6 to 13 days (3).

4.5 Period of Communicability

An individual is infectious at the onset of symptoms. Recent evidence suggests that pre-symptomatic transmission up to 4 days prior to symptom onset may be possible. It is currently unknown what proportion of mpox cases transmit the virus pre-symptomatically, and if the likelihood of pre-symptomatic transmission varies by route of transmission (18, 19). An individual is contagious until all the scabs have fallen off and there is intact skin underneath (about 3-4 weeks). The scabs may also contain infectious virus material (3, 7).

5. Clinical Presentation and Natural History

Clinical diagnosis of mpox can be difficult, and it is often confused with other infections such as syphilis, herpes simplex virus (HSV), chancroid, varicella zoster virus, etc.

Mpox infection can be divided into two periods (1, 2):

1. **Invasion or prodromal period (0 to 5 days):**

Initial symptoms of mpox include fever, intense headache, back pain, myalgia, lymphadenopathy (generalized or localized) and weakness/lack of energy. Cases should be considered infectious during the prodromal period. In some cases, prodromal symptoms may be absent. In some recent cases it appears that the initial lesions may precede the development of fever or other systemic symptoms.

2. **Skin eruption (1 to 3 days (sometimes longer) after fever onset, lasting 2-4 weeks):**

A rash appears following the prodromal period. It is commonly concentrated on the face and extremities (including palms of hands and soles of feet), but may appear anywhere on the body, including the genitals and mucous membranes (e.g., inside the mouth). The rash progresses through four stages: macular, papular, vesicular and pustular, before scabbing over and falling off. Lesions and their exudate are highly contagious. They are often painful and may be pruritic.

Although this virus is not known to be a sexually transmitted infection, sexual exposure (close prolonged contact) is a risk factor, and the lesions may start and be localized to the sites of contact (e.g., genital, or oral lesions).

Once the lesions have resolved (i.e., scabs have fallen off and there is intact skin underneath), the person is no longer considered infectious. For most of the population, mpox infection is a self-limiting disease that lasts up to a month.

The severity of illness can depend upon the initial health of the individual, the route of exposure, and the strain of the infecting virus.

6. Diagnosis of Mpox

6.1 Virus Detection

Routine laboratory testing should be performed to rule out other more common diagnoses (1).

Infectious Diseases should be consulted on all suspect cases for further advice on laboratory testing, diagnosis, and treatment.

Following consultation with Infectious Diseases, if mpox is considered, the following specimens should be sent to Cadham Provincial Laboratory (CPL) for mpox PCR. **Before submitting specimens, notify the CPL physician on call by calling HSC paging at 204-787-2071. Note that special packaging is required for transport of specimens.** On the CPL requisition, clearly indicate the differential diagnosis and relevant exposures, and the request for “mpox PCR”.

- Flocked swab of the lesion fluid: Place the swab in a sterile 5-10 mL CSF conical bottom sample tube or sterile 100 mL urine container. Transport media is not required for mpox PCR testing.
  - Please note that testing for other cutaneous or mucosal viruses requires another flocked swab in **viral/universal transport medium (VTM)**.
- Scab or crust material: Place in a sterile 5-10 mL CSF conical bottom sample tube or sterile 100 mL urine container. Transport media is not required.
- Nasopharyngeal (flocked) swab in VTM: This is optional as it is not the mpox specimen of choice. However, it is quite useful for detecting other more common causes of similar presentations such as coxsackievirus).
- Specimen transport: Transport Canada requires shipping and transport of mpox specimens to follow Category B shipping and certification, as per instructions laid out in the temporary certificate. https://tc.canada.ca/en/dangerous-goods/temporary-certificates/temporary-certificate-tu-0886- monkeypox-samples

Depending on the clinical presentation, other specimens may be recommended by Infectious Diseases. Note that serology for mpox is not available.

7. Control

7.1 Management of Cases

All probable and confirmed cases should be contacted as soon as possible by public health to complete a case investigation, identify contacts, and provide education and isolation instructions. Backward contact tracing is recommended to identify sources of exposure, or exposure venues/events to identify other cases and support case detection.

Isolation precautions should remain in place until the lesion scabs have fallen off and new intact skin has formed below, a process which varies by individual but typically takes two to four weeks.

Active monitoring for the duration of isolation is recommended, until public health determines that isolation precautions can be removed (9). The frequency of active monitoring for a given case may vary during the isolation period, and by the amount of support required by the client. It is recommended to follow-up at a minimum twice weekly, with more frequent monitoring suggested during the first week, and when approaching the end of the isolation period. Regular communication is recommended to support learning about the clinical evolution of the infection, address emerging issues, and encourage the appropriate isolation measures, including connecting the individual to community supports as appropriate. Active monitoring should include instructions on self-care, advice on steps to take if symptoms worsen, when to contact their health care provider and how/when to access medical care.

Individuals who meet a suspect case definition should be advised by their health care provider to isolate at home until the diagnosis is confirmed, or an alternate diagnosis is made. Public health follow-up for suspect cases or probable cases without an epidemiologic link (i.e. probable cases with only reported travel history to or residence in a location where mpox is reported in the 21 days before symptom onset) is generally not required until test results are available. However, in situations in which the index of suspicion for mpox for the suspect case is very high or with a delay in laboratory results is anticipated, public health follow-up can be initiated, including isolation advice, contact identification and case finding through backward contact tracing, pending the results of laboratory testing.

While isolating, cases should:

- Isolate in a separate area from other household members (e.g., private room for sleeping and separate washroom),
    - Unexposed individuals should not be in the home except for essential purposes,
    - If a private room for sleeping is not possible, the case should maintain as much distance as possible from others (e.g., by sleeping in separate beds),
    - If a separate washroom is not possible, the case should clean and disinfect all surfaces and objects they have had contact with and immediately remove and launder used towels.
- Avoid direct touching of other people, including through sexual contact.
    - After being deemed no longer contagious, cases should use barrier protection (e.g., condoms, dental dams) during any sexual activity for 12 weeks (9,16).
- Especially avoid contact with those at higher risk of severe mpox illness including immunosuppressed people, pregnant women, and children under 12 years old (9).
- Practice proper hand hygiene (washing with soap and water for at least 15 seconds or the use of alcohol-based hand sanitizer) and respiratory etiquette (9).
- Wear a well-made, well-fitting mask (medical mask preferred) if sharing space with others,
- Cover any lesions (e.g., long pants, sleeves, bandages).
- Avoid sharing items or objects that may be contaminated with infectious particles from lesions or body fluids such as toothbrushes, razors, sex toys, needles etc.
- Avoid exposing other people to clothes, towels, bedding, linens, or other materials used by the case,
    - Unless unable to do so, the case should be responsible for handling and laundering their own clothing, bedding, towels, etc.,
    - Unless unable to do so, the case should be responsible for handling used utensils and dinnerware.
- Avoid areas commonly used by others in the home, where possible. Surfaces/objects in common spaces that may be accessed by the case should be adequately cleaned and disinfected.
- Cases should consult their health care provider for advice if breastfeeding.
- Avoid contact with animals, including household pets (9, 10).
    - The risk of people passing the virus to animals is unknown at this time. A number of animal species are susceptible to mpox, especially rodent species, but the full range of susceptible animals remains unknown. There has been at least one documented case of a human-to-dog transmission of the virus.
    - To prevent possible spread to animals, including pets and livestock, cases should have another member of their household care for their animals. If this isn't possible, cases should cover all lesions with clothing or bandages, wear a well- fitting medical mask and gloves when near the animals, practice proper hand hygiene before and after contact with the animal or items they have had contact with, and before putting on and after removal of gloves.

  - Cases should avoid handling, feeding or working closely with wildlife to prevent any possible spread of the virus—this is to limit risk of creating a wildlife reservoir for this virus in Canada.
  - If close contact with animals has occurred (e.g., petting, kissing, cuddling, sharing sleeping areas, sharing food) during the case's communicability period, the animal(s) should be monitored for clinical symptoms for 21 days after the exposure. While they are being monitored, they should be kept away from other animals (9).
  - If symptoms of mpox develop in the animal (e.g., fever, depression, not eating, respiratory symptoms, diarrhea, oral ulcers, skin lesions) during the 21-day observation period, a veterinarian should be consulted.
- Only leave isolation to access urgent medical care or for other such emergencies.
- If seeking health care, call ahead to inform them of the situation to avoid exposing other people. Individuals should wear a well-made, well-fitting mask (medical mask preferred), cover any lesions, and avoid exposing others during transportation.
- Do not donate blood or any other body fluid (including sperm) or tissue.
- As much as possible, have necessities delivered to the home, such as medication, groceries, etc.
- Postpone elective medical visits and other elective procedures (e.g., elective dental visits, elective blood tests).
- Do not travel to other cities, regions/provinces/territories or to other countries during the isolation period.

Ideally, only one individual in the home should provide direct care to the case, if and when needed (9). The caregiver should not be someone who is vulnerable to mpox (e.g., pregnant woman, child under 12 years of age, or immunocompromised individuals).

Caregivers should be provided instructions on how to reduce their risk of mpox infection:

- Avoid close physical contact with the case. If close contact is unavoidable, the caregiver should wear a well-fitting medical mask. If direct contact with lesions is unavoidable, the caregiver should also wear disposable gloves. Hand hygiene should be done prior to putting on the gloves and after they are removed.
- Avoid contact with clothing, towels, or bedding used by the case; the case should be responsible for handling and laundering these items. If this is unavoidable, the caregiver or household member handling these items should follow the recommendations outlined in the Household/ Community setting below (9).
- Avoid sharing personal items with the case (e.g., toothbrushes, razors, sex toys, needles, contaminated utensils, etc.) (9).
- Avoid handling utensils and dinnerware that has been used by the case; the case should be responsible for handling and cleaning these items. If this is not possible, the caregiver or household member handling these items should follow instructions outlined in the Household/ Community setting below (9).

- Frequent cleaning and disinfecting of high-touch surfaces and objects in the home, especially those that the case may have had contact with.
- Practicing frequent hand hygiene before and after any contact with a case or after touching surfaces/objects within the case's environment, especially those that the case has had contact with. Avoid touching your eyes, nose, or mouth with unwashed hands.
- Improving ventilation in the home when possible (e.g., opening windows).

As individual situations vary and are unique, isolation approaches used for cases may need to be modified and may include the use of alternate isolation accommodations. Modifications in isolation should be designed to maintain the objectives of this guidance (i.e., rapidly stopping chains of transmission, preventing endemicity, protecting public health and health care in Canada). Since the isolation period is prolonged, cases should be supported as much as possible in a non-punitive approach to maintain isolation.

7.1.1 Household/Community Setting:

Standard household cleaning products/disinfectants can be used according to manufacturer directions to clean contaminated surfaces (e.g., high touch surfaces).

- Laundry (e.g., bedding, towels, clothing, etc.) can transmit the virus and should be handled with care. Do not shake or handle in a manner that could disperse infectious particles (11).
- Hand hygiene should be done after handling of laundry.
- Bedding, towels, and clothing may be washed as usual in a standard washing machine with hot water (e.g., 70°C) and detergent (9). Bleach is not necessary. Dry completely in a standard dryer.
- If the case is unable to launder their own items, caregivers should:
    - Wear a well-fitting medical mask and disposable gloves. The mask and gloves should be properly disposed of after each use. Hand hygiene should be performed before putting on mask and gloves and when they have been removed (11).
    - Ensure the contaminated laundry does not come into contact with their skin or clothing.
    - Cover any skin that could potentially come in contact with the contaminated laundry. If skin is exposed, it should be washed with soap and water and then perform hand hygiene.
    - Any garments from the caregiver that may have come in contact with the contaminated laundry should be removed and cleaned in the same manner as the contaminated laundry.
- Do not share dishes or eating utensils. Routine washing with soap and warm water (dishwasher or by hand) is an effective cleaning and disinfection method.
- Surfaces and objects with which the case may come into contact should be frequently cleaned and disinfected, with particular attention paid to high-touch surfaces and objects (e.g., tabletops, countertops, toilets, door handles, light switches, computer keyboards, etc.) (11).
    - Surfaces should be cleaned and disinfected immediately after use.
- If a surface or object is visibly soiled, it should first be cleaned with regular cleaning products followed by disinfection by a standard household disinfectant. Ensure manufacturer instructions are being followed when using these products. If using household bleach to disinfect (i.e., a 0.1 % sodium hypochlorite solution), instructions on how to dilute bleach are available at the following webpage: Use household chemicals safely - Canada.ca (9)
- Single-use disposable cleaning equipment (e.g., disposable towels) is recommended (9). If disposable cleaning equipment is not available, the cleaning material (cloth, sponge, etc.) should be washed (e.g., with rags) or placed in a disinfectant solution effective against viruses, or 0.1% sodium

hypochlorite. If neither option is available, the cleaning material should be discarded.

- Activities such as dry dusting, sweeping or vacuuming should be avoided (11). Wet cleaning methods are preferred. Rags and mops used for wet cleaning must be laundered according to laundering information above. If a vacuum cleaner equipped with a high-efficiency particulate air (HEPA) filter is available, use this to vacuum upholstered furniture and carpeted floors. Do not vacuum furniture or carpet with a vacuum cleaner without a HEPA filter as this may spread infectious particles (9). Clean upholstered furniture and carpets that require removal of visible soiling, using commercially available cleaning products or professional steam cleaning (11).
- Personal waste (such as used tissues) should be stored securely within disposable garbage bags (10). Vacuum cleaner waste, including disposable filters if your vacuum cleaner has one, should be carefully emptied into a disposable garbage bag. As an additional precaution, all disposable garbage bags should be placed into a second disposable bag, and tied securely, before being disposed of as usual with your household waste. Ensure waste is kept in a secure area or container to prevent exposures to others including people, pets or wild animals (9). You should not recycle any items used while isolating.

7.1.2 Treatment:

Most cases are self-limited and require only supportive treatment. For severe cases, consultation with infectious diseases is recommended for consideration of antiviral treatment.

Tecovirimat (TPOXX) is authorized for sale and use in Canada for the treatment of human smallpox disease. In some countries, its authorization is broader including the treatment of mpox. Data is not available on the effectiveness of Tecovirimat in treating human cases of mpox. Studies using a variety of animal species have shown that Tecovirimat is effective in treating orthopoxvirus-induced disease. Human clinical trials indicated the drug was safe and tolerable with only minor side effects (12). Health care providers may consider using TPOXX for eligible patients with mpox based on clinical judgement. Manitoba is able to access TPOXX from the National Emergency Strategic Stockpile. Previously, access was through the Special Access Program (SAP). A small stock has been pre-positioned in Manitoba, with SAP approval already in place if required.

In Manitoba, release of TPOXX for severe disease must include a consult to an Infectious Disease specialist for recommendations for use. The Infectious Disease specialist must contact the regional Medical Officer of Health (MOH), or the MOH on-call after hours, to approve the release of TPOXX from the provincial vaccine warehouse. The MOH, after confirming recommendations with Infectious Diseases, should call the provincial vaccine warehouse to arrange for shipping of the treatment course to the treating facility.

Other antivirals, (e.g., cidofovir and brincidofovir), are available and may be used to treat human cases of mpox, although data is not available on their effectiveness. However, both have proven activity against poxviruses in in vitro and animal studies (13).

For further information on treatment refer to: www.canada.ca/en/public-health/services/diseases/mpox/health-professionals.html#a7

7.2 Management of Contacts

All probable epi-linked and confirmed cases should be interviewed to identify close contacts, including backward contact tracing for common exposures and source detection. Refer to the exposure risk assessment table below for categories of contacts.

The purpose of contact tracing is to:

- Ensure contacts are aware of:
  - their potential exposure,
  - expectations of monitoring for any signs and symptoms,
  - risk mitigation measures to practice,
  - and what to do if they develop mpox symptoms (i.e., immediate isolation, advising public health/HCP's, and go for testing),
- If eligible, provide information about post-exposure prophylaxis and referral to their health care provider, to prevent the onset of disease and stop further transmission,
- Identify any symptomatic contacts as early as possible,
- Facilitate prompt clinical assessment by a health care provider, laboratory diagnostic testing and assessment for treatment if signs or symptoms develop.

All contacts exposed to the case from the onset of symptoms and until all the scabs have fallen off and there is intact skin underneath (about 3-4 weeks), should be followed-up according to the recommendations in Table 1. Contacts with very high-risk interactions with the case (e.g., intimate or sexual contact) during the pre-symptomatic phase (up to 4 days prior to symptom onset), should also be identified for follow-up.

All contacts identified should be notified and advised to monitor for symptoms for 21 days following their most recent exposure (9). Asymptomatic contacts are not required to self-isolate (quarantine). Should any symptom(s) of mpox develop (including prodromal symptoms of fever, headache, myalgia, or lymphadenopathy), individuals should isolate immediately.

Symptomatic contacts should be assessed by a health care provider and managed as probable cases until an alternative diagnosis is made.

Public notification of high-risk exposures at events/venues may be required if contacts cannot be identified. Explore means of reaching out to high-risk exposure contacts related to events in situations where contacts are unknown (outreach to communities, stakeholder engagement, awareness campaigns, etc.).

Consider proactive, non-stigmatizing communication and outreach strategies to target groups that may be at higher risk of exposure (e.g., populations that engage in riskier sexual behaviors), in collaboration with local community-based stakeholders and organizations.

The priority for public health contact management should be high and intermediate exposures (see Table 1). Low risk contacts do not require public health follow-up, with the exception of health care worker contacts, where there may have been exposures that the case is unaware of (e.g., PPE breach, exposure to contaminated items).

7.2.1 Backwards contact tracing:

In addition to traditional (forward) contact tracing, 'backward' contact tracing may be considered, which focuses on trying to determine where and when the case likely acquired the infection. Backward contact tracing is routinely done as part of case or outbreak investigations for communicable diseases of public health significance when public health collects information on a case's potential acquisition history and can be a valuable tool when human to human transmission is suspected and the case is unable to easily identify where the infection may have been acquired.

Backward contact tracing may help to:

1. Find additional cases by focusing on the setting where a case's exposure likely took place; and
2. Interrupt additional chains of transmission by then employing traditional (forward) contact tracing for the newly identified case(s).

If the source case is identified through backward contact tracing, traditional (forward) contact tracing should be employed, and contacts managed based on their risk of exposure.

7.2.2 Exposure Risk Assessment for Contacts:

Human to human transmission of mpox generally requires prolonged close contact with a confirmed or presumed case. Brief interactions and those where appropriate PPE is used, are not considered a risk for transmission.

Additional considerations that may influence the risk assessment include:

- If a contact has had previous smallpox/mpox vaccination. If so, consider the time since the contact's last vaccine dose. Canadians born in 1972 or later have not been routinely immunized against smallpox (unless immunized for other purposes such as travel or work-related risks). For those who have been previously vaccinated for smallpox, the degree of protection conferred from the smallpox/mpox vaccine against mpox infection may be up to 85%, however the durability of protection and the degree of protection against the current strain of mpox remains unknown (14).
- If the contact has recovered from a previous mpox infection.
- If the contact is a higher risk for severe disease (e.g., immunocompromised, pregnant, or young children) (9).

Table 1 provides guidance for classifying contacts as either high, intermediate, or low risk, depending on their exposure, for the purposes of determining recommended actions. The information provided in Table 1 is not intended to replace more personalized public health advice provided to contacts, based on clinical judgement and comprehensive risk assessments.

Table 1: Contact Management Recommendations by Exposure Risk Level

Risk of Exposure	Description	Examples	Recommendations
High	Prolonged or intimate contact, including: • Skin/mucosa direct contact with a case's biological fluids, secretions, skin lesions or scabs. • Skin/mucosa direct contact with surfaces or objects contaminated by a case's secretions, biological fluids, skin lesions or scabs. • Face-to-face interaction with a case, without the use of a medical mask by the case or contact (3 or more hours (cumulative over 24 hours) while less than 1 metre away, without having worn a medical-grade mask).	• Household members (e.g., family member, roommate) with prolonged contact. • Intimate or sexual contact* (including during the pre-symptomatic phase (up to 4 days prior to symptom onset). • Providing direct physical care without appropriate personal protective equipment (PPE). • High risk environmental contact (e.g., cleaning potentially contaminated rooms without wearing appropriate PPE). • Skin/mucosa contact with a case's unwashed bedding, towels, clothing, lesion dressings, utensils, razors, needles, sex toys, etc.	• Post exposure prophylaxis recommended with smallpox/mpox vaccine. • Monitor for signs and symptoms. • Active monitoring of contact for 21 days after last exposure. • Follow contact public health measures.

Table 1 continued….

Intermediate	• Not meeting high-risk exposure criteria above AND: • Limited or intermittent (1-2 hours cumulative over 24 hours), close proximity exposure to a case without wearing appropriate PPE for the type of exposure risk (i.e., medical mask and gloves). Note: in health care facilities, recommended PPE consists of airborne, droplet, and contact precautions. • Shared living space with interactions with a case or their belongings.	• Person sharing close proximity workspace or other setting for long periods of time	• Monitor for signs and symptoms. • Passive (self) monitoring of contact for 21 days after last exposure. • Follow contact public health measures. • PEP is not routinely recommended for intermediate risk contacts.
Low or Uncertain	• Not meeting the high- or intermediate-risk exposure criteria above AND: • Very limited exposures to a case (e.g., no direct contact, not close, face- to-face interaction, and not prolonged contact). • Wearing appropriate PPE for the type of exposure risk (i.e., medical mask and gloves). Note: in health care facilities, recommended PPE consists of airborne, droplet, and contact precautions.	• Brief social interactions – i.e., brief hug or shaking hands, without direct contact with lesions, where case's lesions are well covered by clothing. • Colleagues not sharing a confined or close- proximity office space	• Public health follow- up not required. • Alert any health care providers that provide medical care of the potential exposure. • Monitor for signs and symptoms. • Passive (self) monitoring of contact for 21 days after last exposure. • Notify public health and isolate immediately if signs or symptoms develop. • PEP is not recommended for low-risk contacts.

***** *During the pre-symptomatic phase (4 days prior to symptom onset of case), only contacts with high-risk interactions of intimate or sexual contact should be followed up as a high risk for exposure. Contacts for all other exposures outlined in the high-risk category and other risk categories, would be determined based on exposure to the case during the symptomatic phase.*

7.2.3 Contact Education:

All high and intermediate risk contacts should be educated on prevention measures that they should follow until they have completed their 21-day monitoring period and have no symptoms (9). Refer to Table 2 below for further summary by exposure risk. Recommendations in Table 2 apply for the 21-day period following the last exposure to a known suspected (unless MPX is ruled out), probable or known case.

- Household contacts should limit contact with cases, including not sharing a room or space with a case, sleeping in the same bed, and wearing a mask (medical mask preferred) if sharing the same space with a case.
- Practice general hygiene measures including proper hand hygiene (washing with soap and water for at least 15 seconds or the use of alcohol-based hand sanitizer) and respiratory etiquette.
- Do not donate blood, cells, tissue, breast milk, semen, or organs during the 21 days after the last exposure.
- Avoid all sexual contact since contacts may be infectious prior to symptoms developing. While condom use and reduction of the number of partners is not completely protective in the case of mpox, it could reduce the risk of exposure.
- Asymptomatic intermediate and high-risk contacts should avoid non-essential interactions in enclosed indoor settings with those at higher risk of severe mpox illness including congregate settings, immunosuppressed people, pregnant women, and children under 12 years old. If this is unavoidable, consider wearing a well-fitting medical mask in these settings or around vulnerable populations. For contacts who work in high-risk settings, they should consult with occupational health.
- Asymptomatic high-risk contacts should consider wearing a mask (medical mask preferred) for source control when in the presence of others in enclosed indoor settings.
- As a precaution to prevent possible spread to animals, including pets and livestock, and until more is known, it is recommended that contacts have another member of their household care for their animals. If this is not possible, contacts should wear a well-fitting medical mask and gloves when near the animals, practice proper hand hygiene before and after contact with the animal or items they have had contact with, and before putting on and after removal of gloves.
- Avoid handling, feeding, or working closely with wildlife to prevent any possible spread of the virus – this is to limit risk of creating a wildlife reservoir for this virus in Canada.

- If symptoms develop, isolate at home, and follow guidance for cases to prevent spread to others. Contacts should notify public health or Health Links – Info Santé (204-788-8200 or toll-free at 1-888- 315-9257) if they develop symptoms and be assessed by their health care provider. They should inform the health care provider of the situation prior to attending the clinic or healthcare facility to avoid exposing other people. Contacts should wear a well-made, well-fitting mask (medical mask preferred), cover any lesions, and avoid exposing others during transportation. Plans for accessing primary care should be reviewed by public health during contact notification/active monitoring to ensure the contact has access to a health care provider that can assess and test for mpox should symptoms develop.

Table 2: Public Health Measures Recommendations for Contacts based on Exposure Risk.

Exposure risk	Recommendations
For all exposures	• All contacts if eligible based on pre-exposure eligibility (PrEP), should be offered Imvamune®. Refer to section 7.2.4 for further guidance. • Can be permitted to continue routine daily activities, with some specific public health measures in place. • Self-monitor for signs and symptoms of mpox infection. • Practice proper hand hygiene and respiratory etiquette. • Practice safe sex behaviors.[a] • Notify public health/health care provider and isolate immediately if signs or symptoms develop. • Alert any health care providers that provide medical care of the potential exposure. • Limit or avoid travel during the 21-day post- exposure period.

For both intermediate- and high-risk exposure contacts	In addition to the above recommendations:
	• Avoid high-risk settings (e.g., congregative living settings, such as jails or shelters) and vulnerable populations (e.g., children under 12 years of age, pregnant women, immunocompromised individuals), where possible.
	  ○ If this is unavoidable, consider wearing a well-fitting medical mask in these settings or around vulnerable populations.
	  ○ For contacts who work in high-risk settings, refer to occupational health and safety advice based on a risk assessment.
	• As a precaution to prevent possible spread to animals, including pets and livestock, and until more is known, it is recommended that contacts:
	  ○ Have another member of their household care for their animals.
	  ▪ If this is not possible, contacts should wear a well-fitting medical mask and gloves when near the animals, frequent hand hygiene before and after contact with animals and clean and disinfect high touch surfaces frequently.
	  ○ Avoid handling, feeding, or working closely with wildlife to prevent any possible spread of the virus – this is to limit risk of creating a wildlife reservoir for this virus in Canada.

Table 2 continued…

For high-risk exposure contacts	In addition to the above recommendations: • Imvamune® vaccination should be offered as post-exposure prophylaxis (PEP) to high-risk contacts of a confirmed or probable case if the contact has had less than 2 dose of Imvamune®. Refer to section 7.2.4 for further guidance. • Wear a well-fitting medical mask whenever in the presence of others (including household members). • Refrain from sexual contact with others. • Be especially vigilant when self-monitoring for symptoms if working with vulnerable populations.
a. While condom use and reduction of the number of partners is not completely protective in the case of MPX, it could reduce the risk of exposure.	

Active monitoring is recommended for high-risk contacts. The frequency of active monitoring for a given contact may vary based on a risk assessment, may vary during the isolation period (more frequent initial contact to reinforce education), and may consider the contacts' exposure risk level (e.g., consider more frequent active monitoring by public health for high-risk contacts, considering ability to adhere to self- monitoring advice and potential trans-mission risk to others). It is recommended to follow-up at a minimum weekly, and at the end of the monitoring period, with more frequent monitoring suggested during the first week to reinforce education, monitor post-exposure prophylaxis if indicated, and answer questions.

The client should monitor for any of the following:

- Fever (38°C) or chills
- Lymphadenopathy
- Skin rash

If symptoms develop, instruct the client to isolate immediately and contact their health care provider and public health office/Health Links- Info Santé. If the client reports symptoms other than fever or rash, advise to isolate for 24 hours and monitor for fever or rash. If fever or rash do not develop, but other symptoms persist, advise the client to follow up with their health care provider for evaluation of potential cause.

7.2.4 Pre- and Post-Exposure Prophylaxis with Orthopoxvirus Vaccine:

IMVAMUNE® is a non-replicating, third generation orthopoxvirus vaccine approved in Canada under the provision of the Extraordinary Use New Drug regulations for mpox and related orthopoxvirus infections and disease in adults 18 years of age and older determined to be at high risk for exposure. IMVAMUNE® is available from Canada's National Emergency Strategic Stockpile (NESS), and has been sent in limited pre-positioning supply shipments to Manitoba for public health use only. The vaccine can be ordered by public health for pre- and post-exposure prophylaxis from the provincial vaccine warehouse.

IMVAMUNE® is a live virus vaccine that is non-replicating (15). Imvamune® is different from previous generations of smallpox vaccines because there is no visible "take" and since it is non-replicating, there is no risk for spread to other parts of the body or other people. Recent studies support the effectiveness of using orthopoxvirus vaccines for both pre-exposure and post-exposure prophylaxis as a measure to assist in controlling the spread of mpox disease (20, 22).

Pre-exposure Prophylaxis (PrEP):

Orthopoxvirus vaccine is effective at protecting people against mpox when given before exposure to mpox. Emerging evidence demonstrates that the two-dose primary series provides better protection than a single dose (9, 21, 22).

Since we do not know the effectiveness of the previous generations of smallpox vaccination against current mpox infection, individuals previously unimmunized or those who have no prior documented history of mpox infection should receive 2 doses of Imvamune® as PrEP if they meet the eligibility criteria. Refer to the provincial mpox website for further information on pre-exposure vaccine eligibility in Manitoba: www.gov.mb.ca/health/publichealth/diseases/mpox.html

Post-exposure Prophylaxis (PEP):

Refer to "***Table 1: Contact Management Recommendations by Exposure Risk Level***" for categories of contacts where post-exposure vaccination with IMVAMUNE® is recommended.

Contacts who have a documented history of mpox virus infection or those who are symptomatic and meet the definition of a suspect, probable or confirmed mpox case should not receive PEP.

For all other contacts in which PEP is recommended, evidence indicates that vaccination after an mpox exposure may help prevent the disease or make it less severe (20). Vaccine should be given within 4 days from the date of exposure to prevent onset of the disease. However, vaccine can be given between 4–14 days after the date of exposure, and may reduce the symptoms of disease, but may not prevent the disease.

Previously unimmunized with Imvamune®
Since we do not know the effectiveness of the previous generations of smallpox vaccination against current mpox infection, all individuals who received previous generations of smallpox vaccine, as well as unimmunized individuals, should receive 1 dose of Imvamune® for PEP if they have been exposed to a probable or confirmed case of mpox. If the person also meets eligibility criteria for PrEP, a second dose of Imvamune® should be offered for administration 28 days later.

1 previous dose of Imvamune®
For contacts that previously received one dose of Imvamune® prior to exposure to a confirmed or probable case, 1 dose of Imvamune® should be administered for PEP if it has been at least 28 days since the pre-exposure dose was received.

2 previous doses of Imvamune®
Consider contact as fully immunized and no PEP required.

Note: Imvamune®, 3rd generation orthopoxvirus vaccine, is labelled as JYNNEOS® and Imvanex® in other jurisdictions. These vaccines are also considered valid when assessing previous vaccination status.

Refer to the National Advisory Committee on Immunization (NACI) interim guidance on the use of Imvamune for monkeypox outbreaks in Canada, including information about the risks/benefits of vaccination for special populations (individuals who are immunocompromised, individuals who are pregnant and/or lactating, children less ≤ 17 years of age, individuals with atopic dermatitis) (14).

Of note in the NACI statement is a list of potential allergens as well as safety information including the unknown risk of myocarditis/pericarditis with Imvamune®. Refer to the product monograph for a list of possible side effects (15).

There is an ethical obligation to conduct close monitoring and surveillance of the use of the vaccine, in order to collect information to inform the response going forward. While both informed consent and post-market safety surveillance will be vital for the ethical implementation of an Imvamune® vaccination program, especially in pediatric populations <18 years of age when the vaccine is being used off-label.

At this point, and in alignment with international expert assessments, including the WHO, there is no need for the vaccine to be used for mass immunization.

7.3 Health Care Facility Management

In addition to Routine Practices, Airborne/Droplet/Contact Precautions are to be used for all suspect, probable and confirmed cases (3). Refer to Manitoba Health's '*Routine Practices and Additional Precautions: Prevention the Transmission of Infection in Health Care*' (17).

Please refer to regional/facility infection prevention and control guidance documents.

7.4 Preventative Measures

There are number of measures that can be taken to prevent infection with mpox virus:

- Be aware of any new or unexplained rash or lesion on you or your partner(s). In some cases, symptoms may be mild, and some people may not even know they have mpox.
- Avoid skin-to-skin or face-to-face contact with anyone who has symptoms. Especially avoid touching any rash.
- Stay home if you are sick and encourage others to do the same.
- Consider minimizing the number of sexual partners that you have - recognizing the risk of mpox spread may be higher with anonymous sexual contact or with multiple partners.
- Use condoms, recognizing condoms alone may not prevent all exposures to mpox since the rash can occur on other parts of the body. Condoms also help prevent other sexually transmitted infections.
- Get vaccinated if eligible.
- Avoid contact with any materials, such as bedding, that has been in contact with an infected individual.
- Isolate infected cases from others who could be at risk for infection.
- Practice good hand hygiene by washing hands with soap and water or using an alcohol-based hand sanitizer after contact with infected animals, people or contaminated materials or items.
- Use personal protective equipment (PPE) when caring for cases.
- Avoid contact with animals or objects that could harbor the virus (including animals that are sick or that have been found dead in areas where mpox occurs).

8. Key Components of the Public Health Response

Key components of the public health response include:

- Isolation of cases until deemed no longer contagious.
- Identifying and mitigating any barriers to effective isolation at the home, as well as providing appropriate supports as needed.
- Active monitoring of mpox cases and high risk contacts.
- Providing information on public health measures that the case, along with their caregiver and household members, should follow.
- Providing general advice on steps to take if symptoms worsen, including instruction on self-care, when to contact their health care provider and how/when to access medical care.
- Identifying all contacts during the case's period of communicability.
- Outbreak and communications to group(s) of individuals potentially exposed during an event or while at a location.
- Post-exposure prophylaxis with orthopoxvirus vaccine as indicated for contacts.

8.1 Documentation Guidelines and Resources

All case investigations are to be completed in PHIMS. For public health providers without access to PHIMS, the case/contact investigation forms should be completed and submitted for entry to the Manitoba Health Surveillance Unit. The critical data elements which are required documentation for all case and contact investigation are listed with a "*" on the Investigation Forms:

- Mpox (*Orthopoxvirus*) Case Investigation Form
  https://www.gov.mb.ca/health/publichealth/surveillance/docs/mhsu_0003.pdf
- Mpox (*Orthopoxvirus*) Contact Investigation Form
  https://www.gov.mb.ca/health/publichealth/surveillance/docs/mhsu_0003a.pdf
- Instructions/User Guides provide further documentation guidance:
  https://www.gov.mb.ca/health/publichealth/surveillance/docs/mhsu_0003_ug.pdf

PHIMS Quick Reference and User Guides are available at https://phimsmb.ca

8.2 Regional Public Health Timelines for Documenting Mpox Cases in PHIMS and Public Heath Responses

The following is intended to provide broad guidance and timelines for the majority of mpox case and contact investigations but may not align with the chronology or flow of some investigations.

Investigation Component	PHIMS Data Entry/Public Health Response	Timeline from Public Health Report Date *Days refer to working days*
MHSU Initial Notification - Clinical Notification Form or Laboratory result	• Create an investigation. Use CD Encounter Group, assign the disease "Monkeypox". • Assign the case classification – "person under investigation "Investigation disposition > Pending Investigation status > Open • Upload the clinical notification form with the investigation in context and chart a note indicating same. *Email the regional CDC general inbox (copy Provincial CD MOHs, Epi leads) to alert regional public health of the investigation, include the investigation ID.	Same day
OR *Case Report Form when submitted after the Clinical Notification Form*	• Upon receipt of a case report form, if not entered by regional public health in PHIMS (e.g. for case in non-RHA jurisdiction), upload with the investigation in context and chart a clinical note. The MHSU will enter all data elements in PHIMS.	
Regional Coordinators/CD admin	• Ensure routine daily running of investigation search reports for open and pending investigations, and ensure that the case classification, investigation status and disposition are updated as required.	
Region receives new Investigation from MHSU. Responsible Org and Workgroup assigned by MHSU **OR** Report of new investigation outside of PHIMS (e.g. Report from a care provider of a diagnostic that did not go through CPL and MHSU)	• Assign Primary Investigator or CD Coordinator and review investigation and lab results • Contact provider and initiate case and contact investigation. • Update Classification based on case definition and classification date • Update Disposition from Pending (e.g. Follow up in Progress) • Contact case directly and proceed with case investigation. • Connect with MHSU if investigation not created	1 Day

If a case form is received, enter information into PHIMS.	• Complete and update PHIMS data as soon as possible, including on weekends. • For severe cases, document treatment as an **intervention** as soon as confirmed. • Enter contacts (identified either by testing practitioner or contact with client)	1-3 days
Close investigation: when investigation complete.	Update Disposition: Follow up Complete OR Lost to Follow up, OR Unable to Locate. Investigation Status: Closed.	4 weeks
Quality Assurance	Each region employs a Quality Assurance process (Classification, Disposition, Treatment, Closure).	1 week post investigation closure
	• Routinely run investigation search reports for *closed* and *follow-up complete* investigations as a matter of routine practice.	

8.3 Regional Public Health Timelines for Documenting Mpox Contacts in PHIMS and Public Health Responses

For unknown contacts (those whose identity cannot be confirmed) documented in PHIMS (Transmission Event Disposition Details), follow the same basic investigation steps until two unique identifiers confirmed and the unknown contact is converted to a known client in PHIMS.

Investigation Component	**PHIMS Data Entry/Public Health Response**	**Timeline from Public Health Report Date** *Days refer to working days*
Region receives or creates a new Investigation	Assign Primary Investigator, Responsible Organization, and Workgroup	1 Day
Primary investigator attempts to locate and contact client for notification of exposure	Update Disposition: Follow up in Progress	1 Day

Critical data elements listed on form	Complete PHIMS documentation as soon as available, including on weekends. Document all interventions, including post-exposure prophylaxis and follow-up for active monitoring. If contact tests positive, close contact investigation with **Disposition: Contact Turned Case.** Continue documentation in Case Investigation. If unable to locate client and/or unable to meet basic care criteria (client not notified of exposure, no treatment provided) – hold open for 21 days with regular attempts to locate, reconnect with testing practitioner.	1-3 days
Close investigation when investigation complete (contact, notified, and monitored for 21 days) Close if unable to complete (e.g., lost to follow up)	• Disposition: Follow up Complete, OR, Lost to Follow Up/Unable to Locate. • High risk contacts should remain open until monitoring period is complete and confirmed asymptomatic. • Intermediate contacts can be closed after notification and education provided. • Status Closed.	21 days
Quality Assurance	• CD Coordinator Review by Quality Assurance Report level for minimal data elements only	1 week post closure of investigation

Inter-jurisdictional Notifications:

- If, during the course of the investigation, it is determined that there was either acquisition or transmission in another jurisdiction, this should be noted in PHIMS under the Exposures section of the Case Investigation Form. If outside of Manitoba, the Manitoba Health Surveillance Unit (MHSU) should be notified to refer this information to the appropriate jurisdiction. MHSU must also provide exposure location and other pertinent details, such as dates that the individual was at the location, as part of the referred information. If the exposure occurred in another jurisdiction within Manitoba, the primary investigator must notify the region where the exposure occurred. In general, the region where the exposure occurred is responsible for follow-up related to the exposure.
    - For international exposures, to support notification, additional information is necessary such as any high-risk contacts in the foreign countries (names and contact information required for the high-risk contacts), hotel / resort or private location the case stayed at while infectious, or events/venues where there were significant exposures while infectious. Please note that in

most instances, the identity of the case (i.e., name and phone number) is not required for these notifications; however, case information (e.g., test date or symptom onset date) are required. If sending flight information, be sure to include airline(s), flight number(s), departing city / airport, destination city / airport, flight date(s), and impacted row/seats.

- If the MHSU receives a positive lab for a client who has tested within Manitoba, but has a current address out of province, the investigation will be forwarded to the jurisdiction where the client resides but will also be assigned to a Manitoba responsible organization as a secondary investigator based on the test location. Regions, when identified as secondary ROs, would contact the client and assume responsibility for managing the case or contact while they remain in Manitoba. If the client is no longer in Manitoba, any relevant exposures in Manitoba should be elicited from the client if possible and managed as appropriate. When the Manitoba investigation is complete, the investigation disposition should be set to "Pending - Referral Out of Region", which will flag the MHSU to close the investigation and redirect to the province where the client resides. If the disposition is not changed by the Region, the case will **not** be redirected to the province. The case will NOT be counted in MB as the address is out of province, but the bidirectional process will ensure there is awareness of any exposures or follow-up required in Manitoba.

9. Outbreak Management

Regional Communicable Disease Coordinators should create an outbreak in PHIMS if multiple linked cases are identified. Refer to the Outbreak Module SOP for guidance on documenting outbreaks in PHIMS. All case/contact investigations within a transmission chain should be linked to the outbreak.

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