



## Monkeypox

Information for healthcare providers about monkeypox.

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### On the page

1. [Current situation](#)
2. [Clinical presentation](#)
3. [Transmission](#)
4. [Management of suspected cases](#)
5. [Infection prevention and control](#)
6. [Treatment](#)
7. [Prevention](#)
8. [Patient transport](#)

Monkeypox is a viral infection, caused by a virus of the Orthopoxvirus genus related to smallpox. Until recently, monkeypox was mostly present in Central and West African countries, with sporadic cases occasionally in travellers.

Since early May 2022, the United Kingdom, USA and European countries have seen rising cases of monkeypox. Although at least one initial UK case was related to travel to an African country, most cases did not report any travel history. Genomic studies in UK and Portugal linked many recent cases with the West African clade, as seen in previous years' outbreaks in the USA, Israel and Singapore and the 2017-2018 Nigeria outbreak. First monkeypox cases in Canada were reported on May 19, 2022 in Montreal and [additional cases continue to be reported federally](#).

Among these cases, a high proportion are in people who self-identify as gay, bisexual and other men who have sex with men (gbMSM). Though the reported cases thus far have been primarily among gbMSM, it is important to note that anyone can become exposed and infected. Monkeypox is not known to be sexually transmitted, but it can occur through close direct contact. Anyone with close and prolonged contact with a case of monkeypox is at risk of having the infection. Stigmatizing any group will hinder appropriate infection prevention and control efforts, and will be detrimental to the identification and management of additional cases. The recent cases among gbMSM are likely due in part to shared social networks, as well as large events that may have facilitated transmission.

In BC, public health will follow up with individuals who may have been exposed to monkeypox or who are identified as cases.

## Clinical presentation

**Incubation:** 5 to 21 days, usually 7 to 14 days



a) early vesicle,  
3mm diameter



b) small pustule,  
2mm diameter



c) umbilicated pustule,  
3-4mm diameter



d) ulcerated lesion,  
5mm diameter



e) crusting of a mature  
lesion



f) partially removed  
scab

Image credit: United Kingdom

Clinical presentation resembles smallpox but is less severe. Symptoms can vary depending on different factors, including exposure characteristics, age, presence of conditions that alter immune response, previous immunity for smallpox and viral strain.

Monkeypox infection has two clinical phases:

1. A prodromal illness that lasts between 1 to 5 days followed by fever, intense headache, lymphadenopathy, back pain, myalgia, fatigue. Other symptoms have been also described, such as sore throat, cough and less frequently, vomiting or diarrhea.

In some cases, no prodromal symptoms were reported or these symptoms occurred after the beginning of the rash.

2. A skin rash that begins 1-5 days after fever.

The rash evolves from macules, papules, vesicles then pustules, before crusting, which then scale off. Lesions are frequently painful and can be pruritic.

The number of lesions and affected regions can vary, but frequently these involve the face, palms, soles of feet, oral mucous membranes, and genitalia. The trunk can be involved and occasionally there is ocular involvement, most commonly affecting the conjunctivae and cornea.

In the classical description, the rash often begins on the face and spreads to other parts of the body. However, some cases reported in Canada and other countries since May 2022 presented only with genital lesions.

Symptoms last 2 to 4 weeks.

Children, pregnant women and some immunocompromised individuals are considered at higher risk for severe disease. Recent cases in Canada and western countries have been described as mild. Since May 2022, no deaths have been reported in western countries. The case-fatality rate with the West African clade has previously been estimated at approximately 1%.

Long-term skin effects, such as prolonged ulcer healing and scarring, have been described in the literature. Data from previous outbreaks and cases in African countries also mention some less common but serious complications, including secondary infections, pneumonia, sepsis, encephalitis and keratitis leading to vision loss.

## Differential diagnosis

Given the epidemiology of the cases confirmed thus far in Europe and North America, clinicians should be aware of the differential diagnosis as lesions associated with monkeypox can resemble several other infections, including:

- Herpesviruses (e.g. herpes simplex virus, varicella zoster virus [i.e. shingles and chicken pox])
- Enterovirus (e.g. hand foot and mouth disease)
- Syphilis (*Treponema pallidum*)
- Bacterial skin infections
- Medication-associated allergies
- Other poxviruses (e.g. molluscum contagiosum)

Features of monkeypox virus infection may overlap with sexually transmitted infections (STI), and co-infections are possible. For each individual, consider risk-informed STI testing.

## Transmission

**Period of communicability:** during the symptomatic period, including the prodrome. Lesions are considered infectious until the scabs fall off and new skin can be seen.

### Modes of transmission

Monkeypox doesn't generally spread easily between people. Most historical transmissions occurred through close contact with infected animals (bite, scratch or ingesting meat). The current global outbreak, however, is facilitated by human to human transmission.

Human-to-human transmission occurs via:

- Direct contact with cutaneous or mucosal lesions;
- Fomites, i.e. contaminated material such as linens or clothing;
- Respiratory droplets from prolonged face-to-face contact.

Currently, it is not known to be present in anogenital fluids (e.g. sperm, vaginal secretions). Transmissions in the context of sexual activity are related to close contact as described above.

It is recommended that airborne, droplet and contact precautions be used in the clinical setting.

## Management of suspected cases

All suspected cases should be discussed with your local microbiologist and infectious disease specialist to coordinate appropriate diagnostic testing and management. Please obtain infection control guidance and report suspected cases to the local Medical Health Officer immediately.

### Diagnosis & Testing

Monkeypox diagnosis is confirmed by PCR testing (presence of monkeypox DNA in patient samples).

**Before sampling, consult with a local Microbiologist and the Microbiologist on call at BCCDC PHL (604-661-7033).** For the consult, please consider the following aspects:

- Assess relevant patient history including clinical presentation, underlying diseases, exposure risk and travel history. Suspect, probable, and confirmed monkeypox case definitions are helpful for this, and are available on the BCCDC website: [Monkeypox case definition](#)
- [List of countries with confirmed monkeypox cases](#)

If sampling for monkeypox virus is indicated from above consultation, please proceed as following:

- For all individuals, if skin lesions are present, it is recommended to collect lesion material (roofs, crusts, aspirate, exudate, tissue), including dry swabs or swabs in Universal Transport Medium (UTM).
- For individuals who do not have skin lesions and are suspected to be in the first stage of illness (prodrome), oropharyngeal swabs, nasopharyngeal swabs, EDTA blood and urine can also be considered for testing; please discuss with a microbiologist on call before

collecting and submitting these sample types.

- For individuals who have passed the first and second clinical stages, and in whom monkeypox was suspected, urine should be considered for testing (serology is currently not available); please discuss with a microbiologist on call before collecting and submitting these sample types.
- Collected specimens should be stored and shipped refrigerated, with the exception of tissues which should be frozen for storage and shipment. Monkeypox is a Risk Group 3 pathogen. Samples from suspect cases can be shipped by ground to laboratories as TDG Category B (temporary Transport Canada certificate) but need to be shipped as TDG Category A by air.
- Given that the differential includes HSV, VZV and enterovirus, frontline testing laboratories should consider testing for HSV, VZV and enterovirus on lesion material using Containment Level 2+ procedures. If testing for these is not available at the frontline laboratory, this should be indicated to the BCCDC PHL to perform testing.
- Routine chemistry and haematology can proceed as normal given the existing safeguards that are routinely followed to protect staff from bloodborne infections.
- The BCCDC Public Health Laboratory is now performing in-house PCR testing for monkeypox virus, with sequencing confirmation. For now, samples will continue to be forwarded to the National Microbiology Laboratory for monkeypox PCR as well.
- The turnaround time for BCCDC PHL testing is approximately 24 hours from specimen receipt and the turnaround time for NML testing is 2 calendar days once the sample is received. For other testing details, please refer to the [BCCDC Public Health Laboratory test menu on eLab](#)
- Use the BCCDC PHL [Virology Requisition](#) and indicate "Monkeypox" in the PATIENT STATUS/TRAVEL HISTORY/EXPOSURE" box.

## Infection Prevention & Control

- **Implement airborne, droplet and contact precautions** in addition to following routine infection prevention and control practices
  - Have the patient wear a medical mask and perform hand hygiene
  - Consult IPC and organizational guidelines regarding patient placement. Preferred room placement is an airborne infection isolation room (i.e., negative pressure room); if one is not available, use a private room with the door closed.
  - Refer to your organizational procedures for additional precautions, or to [Public Health Agency of Canada's Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Healthcare Settings guidance](#).
  - Refer to [PICNet video resources](#) for donning and doffing personal protective equipment
  - For further consultation and before discontinuing airborne, droplet and contact precautions, contact IPC in health authority-operated sites and public health in community.
  - Be vigilant with routine IPC practices, including hand hygiene, cleaning and disinfecting equipment, and cleaning and disinfecting the care environment according to usual protocols.
    - Use hospital-grade disinfectants for equipment and environmental cleaning and disinfection. Follow manufacturer's recommendations for concentration, contact time and care in handling.
    - Carefully handle used and soiled laundry (e.g., bedding, towels, patient gowns) by wearing appropriate PPE, and avoiding excessive shaking or flipping to prevent environmental or self-contamination. Place laundry in impermeable, leak-proof soiled linen bags and tightly seal before transporting to medical laundering area or facility. If these are not available, the items can be washed in a standard washing machine using hot water (70 degrees Celsius) with detergent and must be completely dried in a dryer.

## Treatment

Most individuals with monkeypox have mild symptoms and do not require any specific interventions. Treatment for monkeypox remains supportive and targeted on symptoms (e.g. fever control, hydration support, treat secondary infections). There are no specific antiviral treatments that have proven to be effective in human cases of monkeypox.

The antivirals cidofovir, brindofovir, and tecovirimat have all been examined in in vitro and/or animal models, and may be considered in severe cases of human monkeypox on a case-by-case basis. Specifically, the antiviral tecovirimat may be considered as an 'off-label' treatment for monkeypox if needed, though this would be done on a case-by-case basis.

Health Canada maintains a limited stockpile of monkeypox vaccine (Imvamune™) that will be made available to BCCDC for use in the event of monkeypox cases. Its likely use will be for the timely administration of a dose of vaccine to those who have been in direct contact with a person with confirmed monkeypox. Such administration is expected to lower the risk of an infection or its severity. The National Advisory Committee on Immunization is developing recommendations for use. This product is not intended for any large-scale immunization campaign including as a travel vaccine.

## Prevention

Suspected cases should be instructed to limit their contact until results are obtained and practice frequent hand and respiratory hygiene. Lesions should be covered whenever possible, and objects manipulated by the case only.

## Patient Transport

If a patient suspected or confirmed to have monkeypox requires transportation, the patient must be provided with a medical mask and lesions must be covered (e.g., patient gown, sheet or dry dressing). The receiving department/facility and transporting personnel should be informed of the need for airborne, droplet and contact precautions.

### Related links

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Information for the public

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Public Health Agency of Canada: Outbreak update

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Canada's interim guidance on infection prevention and control within healthcare settings

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WHO monkeypox fact sheet

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UK: Guidance on monkeypox

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Centre for Disease Control monkeypox information

**SOURCE:** Monkeypox (<http://www.bccdc.ca/health-professionals/clinical-resources/monkeypox>)

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