



## Monkeypox

Information for healthcare providers about monkeypox.

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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])
- Syphilis (*Treponema pallidum*)
- Chancroid (*Haemophilus ducreyi*)
- Other poxviruses (e.g. *molluscum contagiosum*)
- Lymphogranuloma venereum (LGV)

## 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). Before sampling, consult Microbiologist on call at BCCDC PHL (604-661-7033).

- 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). Samples should be shipped refrigerated for monkeypox virus testing.
- 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 testing should be considered for testing as well as serology, although for the latter testing is not currently widely available; please discuss with a microbiologist on call before collecting and submitting these sample types.
- Monkeypox is a Risk Group 3 pathogen and samples from suspect cases need to be shipped as TGD category A to laboratories.
- Given that the differential includes HSV and VZV, frontline testing laboratories should consider testing for HSV and VZV using Containment Level 2+ procedures.
- Routine chemistry and haematology can proceed as normal given the existing safeguards that are routinely followed to protect staff from bloodborne infections.

- For now, samples will be forwarded from the BCCDC PHL to the National Microbiology Laboratory for Monkeypox PCR and we are exploring the feasibility of implementing local monkeypox PCR and sequence-based detection.

A [NML Special Pathogens requisition](#) that includes exposure risk needs to be completed.

The turnaround time for testing is approximately 2 calendar days once the sample is received at the NML. For other testing details, please refer to the [BCCDC Public Health Laboratory test menu on eLab](#)

## 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 avoiding excessive shaking or flipping to prevent environmental or self-contamination.

## 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.

## References

- [WHO monkeypox fact sheet](#)
- [Centre for Disease Control monkeypox information](#)
- [UK: Guidance on monkeypox](#)
- [Public Health Agency of Canada](#)

