

DATE:	2022 May 20
TO:	All physicians and Clinicians
FROM:	Public Health Laboratory (PROVLAB), Alberta Precision Laboratories (APL)
RE:	Testing for Monkeypox

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Key Message

- Monkeypox is an illness caused by a zoonotic poxvirus.
- In May 2022, multiple cases of monkeypox in humans have been reported from the United Kingdom, Europe, Eastern Canada, and the United States. Multiple other countries have cases under investigation.
- Testing for monkeypox is available through the Public Health Laboratory (ProvLab).
- Clinicians are advised to consult with the Virologist-on-call (VOC) **and** the AHS Medical Officer of Health (MOH) on-call for **all** cases of suspected monkeypox.
- Further details regarding the specimen types and tests available can be found in the APL Test Directory and below.

Background

- Monkeypox is an illness caused by a zoonotic orthopoxvirus, which is in the same genus as the variola (smallpox) and vaccinia (smallpox-vaccine) poxviruses. There exist two distinct strains or clades of the monkeypox virus – one found in Central Africa and another found in Western Africa. Monkeypox is classically an illness contracted upon exposure to small forest animals in these areas who are infected (such as rodents, squirrels, or monkeys). Human-to-human transmission is thought to occur primarily through large respiratory droplets. Respiratory droplets generally cannot travel more than a few feet, so prolonged face-to-face contact is required. Other human-to-human methods of transmission include direct contact with body fluids, including sexual contact, or lesion material, and indirect contact with lesion material, such as through contaminated clothing or linens.
- Most cases of monkeypox to date have occurred in individuals residing in Central and West Africa, with several small outbreaks outside the African continent due to exposure to infected animals exported from these regions. The incubation is estimated to be 7-14 days or so from exposure (range 5-21 days dependent upon mode of transmission). The illness is generally characterized by systemic symptoms of fevers, chills, myalgias, lymphadenopathy, headache and a characteristic rash.
- The rash in monkeypox starts on the trunk and spreads peripherally to involve the palms and soles of the hands and feet (and can involve mucous membranes). Skin lesions range from 0.5-1cm and begin as macules and papules, progressing to vesicles, pustules, followed by umbilication, scabbing, and desquamation over 2-4 weeks. Rash/lesions have also been described as occurring in isolated areas such as the face and/or genital areas in some cases. This may be dependent on area of exposure.
- In comparison to rashes of chickenpox, rash development is slow with lesions characteristically all in the same stage of development in most cases. However, lesions at atypical stages or crops of



vesicles similar to varicella have been described in ~20% of cases as described by one source. Vesicles/lesions in different stages of development generally suggests an alternate diagnosis. The rash is preceded by 2-4 days of fever.

- Associated lymphadenitis with such a rash is only rarely seen with measles and typically absent in chickenpox. Mortality of monkeypox is estimated to range from 1 to 11%.

Virologic Diagnosis of Monkeypox

- Monkeypox is diagnosed in the laboratory by direct detection of viral DNA using a nucleic acid amplification test from various specimens (also known as PCR or NAT). Testing for monkeypox in Alberta is done via referring of specimens to the National Microbiology Laboratory (Public Health Agency of Canada, Winnipeg, MB).

What do I do if I suspect a patient has monkeypox?

1. Ensure appropriate infection prevention and control measures are implemented:
 - (A) Use contact + droplet + airborne precautions
Person-to-person transmission primarily occurs via large respiratory droplets and/or direct contact with infective lesions or material. There is a theoretical risk of airborne transmission. These recommendations may change as more data becomes available.
 - (B) If seen in a community clinic/urgent care center, provide patient with a surgical/procedure mask and place them in a separate room with the door closed immediately upon arrival. After the patient leaves, the room should remain empty with the door closed for 2 hours, and then cleaned using routine cleaning/disinfection protocols.
 - (C) See AHS IPC resource manuals for further details:
 - a. IPC Acute Care Resource manual – Diseases and conditions table page 150 (<https://albertahealthservices.ca/assets/healthinfo/ipc/hi-ipc-resource-manual-main-document.pdf>).
 - b. IPC Community-based Service Resource Manual (<https://albertahealthservices.ca/assets/healthinfo/ipc/hi-ipc-community-based-services-resource-manual.pdf>).
2. It is advised that prior to collection of any specimens for monkeypox testing, clinicians should **always** notify the Zone Medical Officer of Health/Public Health and consult with the Virologist-on-call (VOC) at the ProvLab. The VOC can be paged by calling 403-944-1200 (Calgary) or 780-407-8822 (Edmonton).
3. Specimens acceptable for testing:
 - a. Lesion fluid and/or crust material
 - b. Scab
 - c. Skin material around lesions
 - d. CSF **and** serum from encephalopathic patients
 - e. Formalin-fixed / paraffin embedded tissues (*although non-fixed specimens are routinely preferred*).



4. Specimen submission:

Specimen Type	How to Submit
Lesion fluid, crust material, fluid, scab	Submit specimens in sterile containers. Ideally 1.5-5.0 mL tubes. If not available, use a sterile orange top container. Vesicle fluid, scab material, or related tissues are more preferred than dry swabs. Dry swabs can be submitted by collecting a dry specimen swab and cutting the end into a sterile orange-top container. Addition of universal transport media (the pink liquid) is NOT advised in order to avoid dilution. For investigation of other aetiologies such as HSV, VZV, Syphilis, etc., please submit a separate swab in universal transport media.
Tissue and biopsies	Fresh biopsy tissue should be placed in sterile containers.
Formalin or paraffin fixed tissues	Should be sent in plastic containers and clearly identified as being in formalin. Paraffin embedded tissues can be sent as entire blocks or four-six 10 µm sections in a plastic tube or vial.
Serum	Collect serum in either a red top tube OR serum separator tubes (gold top). In adults, it is ideal to have at least 3-5mL of blood. Blood should generally be collected for monkeypox PCR in encephalopathy. <i>There are no serology tests available for monkeypox.</i>

Further information about specimen collection can be found in the NML Monkeypox Guide to Services page (<https://cnphi.canada.ca/gts/reference-diagnostic-test/5030?searchQuery=monkeypox>). Requisitions can be found at <https://www.albertahealthservices.ca/frm-20087.pdf>.

5. If in doubt as to how to collect specimens, please consult with the VOC (page via 403-944-1200 in Calgary and 780-407-8822 in Edmonton).
6. If specimens are collected in a hospital system, please avoid use of the pneumatic transport tubes. Specimens collected from outpatients (clinics) or urgent care, may require different arrangements from the laboratory. Any specimen collected from a patient with suspected or confirmed monkeypox virus, must be packaged and labeled as *Category A, UN2814, Infectious substances, affecting humans (monkeypox virus). Transport using Type P620 packaging as well as accompanied with proper shipping document.*
 - Further information on monkeypox can be found at <https://www.who.int/emergencies/disease-outbreak-news/item/2022-DON381>.

Questions/Concerns

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