Mpox Quicksheet

May 2024

Mpox Basics

Infectious agent

Mpox (formerly known as monkeypox) is a viral infection caused by the *monkeypox virus* (MPXV), a type of *Orthopoxvirus.* This genus also includes the *variola virus* (smallpox) and the *vaccinia virus* that is used in the smallpox vaccine. There are two clades of MPXV: Clade I, previously known as the Congo Basin clade, and Clade II, previously known as the West Africa clade. A subtype of Clade II (Clade IIb) is responsible for the ongoing 2022-2024 global mpox outbreak.

Epidemiology

In California, MPXV continues to be monitored through mpox case reporting and laboratory surveillance, including wastewater detection. Mpox is zoonotic disease endemic to certain regions in Africa. The ongoing Clade IIb outbreak has been novel with the extent of human-to-human transmission in non-endemic areas; data suggests that most cases have been among gay, bisexual, and other men who have sex with men and their social networks. Persons with severe immunocompromise or other skin conditions, children under the age of 1 year, and persons who are pregnant are more likely to experience severe disease outcomes. Deaths in this outbreak have been rare; all documented deaths with available data in the U.S. to date have been among persons with severe immunocompromise. Infections can occur in persons with a history of mpox and in those who have received the mpox vaccine.

To date, Clade I MPXV has not been detected outside of endemic regions in Africa; however, an ongoing Clade I outbreak in the Democratic of the Congo (DRC) has prompted enhanced clade-specific surveillance in the United States. Clade I MPXV has historically been associated with more severe disease and increased transmissibility, though medical countermeasures used for Clade IIb MPXV, including vaccines and treatment, are anticipated to be effective for Clade I MPXV. Notify CDPH if Clade I MPXV is suspected: See information on clade-specific testing below and CDPH Health Advisory: Clade I Mpox Virus with Geographic Spread in the Democratic Republic of the Congo: Recommendations for California Health Care Providers 12/11/2023.

Clinical symptoms

Most people with mpox infection will develop a rash or lesion(s). Mpox may present as only a single lesion, several lesions localized to one area, or disseminated across the body. Lesions localized near the genitals, anus, and/or mouth have been common in the current outbreak; the hands, feet, chest, face, or eyes are also commonly affected. Lesions may be painful or itchy and often progress through four stages (from macular, papular, vesicular, to pustular) before scabbing over.

Mpox may start with or without a flu-like prodrome such as fever, lethargy, swollen lymph nodes, and generalized body aches several days before developing lesion(s). Some persons have experienced respiratory symptoms such as sore throat, nasal congestion, or cough. Proctitis and symptoms such as purulent or bloody stools, rectal pain and/or bleeding have also been common in this outbreak. Depending on disease severity and lesion location, hospitalization may sometimes be required for secondary complications and more severe presentations.

Modes of transmission

Mpox is primarily spread through close, personal contact:

- Direct skin-to-skin contact with the sores or scabs of people with mpox
- Direct contact with body fluids of people with mpox, such as drainage from skin sores or saliva that was in contact with mouth sores
- Transmission from pregnant person to the fetus during pregnancy or to the newborn during delivery

Most exposures in this outbreak have been associated with close, direct contact including intimate activities (oral, anal, or vaginal sex; genital contact; kissing, hugging, or massage) and through other repeated close contact within shared households. Mpox can also spread through touching contaminated materials used by a person with mpox (such as clothing, towels, bedding, utensils, and cups), or by respiratory secretions during close, prolonged, unmasked face-to-face contact—these modes of transmission appear to be less common in the current outbreak.

Mpox may also be transmitted through exposure to infected mammals, their fluids and/or waste. Persons with mpox should avoid contact with animals during isolation. See Mpox in Animals and Pets | Mpox | CDC.

Infectious period
Mpox is considered infectious from the time of symptom onset until all lesions have healed, with scabs having fallen off and a fresh layer of skin formed underneath—this can take several weeks. Newer data also suggests some people may be contagious 1-4 days before symptom onset**.** To date, there is no clear evidence of transmission from people who never develop symptoms.

Incubation period
Incubation period from time of exposure to symptom onset is up to 3 weeks (range 5-21 days).

Treatment of mpox
Supportive care and/or pain management are appropriate for all patients with mpox symptoms; individuals should talk with their provider about over-the-counter and prescription options. Many cases will be relatively mild and resolve without additional treatment, though prognosis depends on multiple factors including vaccination, baseline health status, concurrent illness, and comorbidities.

Antiviral treatment such as Tecovirimat (TPOXX) is available and recommended for persons at risk of severe disease or complications. Oral TPOXX is primarily available through referral to Study of Tecovirimat for Human Mpox Virus (STOMP*)*. Disease investigators are encouraged to inform all cases, regardless of disease severity, about the STOMP trial. Individuals may self-enroll in STOMP or request a referral from their provider—see California Prevention Training Center STOMP Resources for informational flyers. Some providers may prescribe oral or IV TPOXX under CDC EA-IND (Expanded Access Investigational New Drug) protocol. See CDPH Mpox Treatment with TPOXX: Information for Providers and CDPH Supportive Care Suggestions for Mpox for more information on mpox treatment options.

Prevention with mpox vaccine
The JYNNEOS vaccine is a two-dose vaccine series recommended for anyone who may be at risk for mpox. It may be given as pre- or post-exposure prophylaxis against mpox. Data shows that JYNNEOS is effective at preventing severe mpox infection; however, only 43% of persons at-risk in California have received both doses of the vaccine as of January 2024.

LHJs should be aware of JYNNEOS availability in their community, including where to refer for vaccination. LHJs are also encouraged to assess local circumstances and needs for mpox vaccination based on local morbidity, infection rate, equity, and populations at risk. See CDPH Mpox Vaccines for more information.

Mpox Laboratory Testing

Mpox testing is done via polymerase chain reaction (PCR) assays for *monkeypox virus* or *orthopoxvirus* performed on swabs of lesion(s). Testing is available through most commercial laboratories as well as CDPH VRDL and certain local public health laboratories. When Clade I is suspected, please send specimens to the local public health lab (as opposed to commercial labs) for forwarding to the state public health lab.

Providers should follow these steps to sample lesions for mpox:

1. Collector should wear appropriate personal protective equipment, which includes gown, gloves, eye protection, and fit-tested NIOSH-approved particulate respirator with N95 filters or higher.
2. Use 1-2 sterile, synthetic swabs (including but not limited to polyester, nylon, or Dacron) as specified by lab submission criteria*. Do not use cotton swabs.
3. Vigorously swab the lesion to collect adequate DNA and place into appropriate sterile container as specified in lab submission criteria*. Do not de-roof or aspirate lesion(s).
4. Given variation in rash presentations, collection of multiple specimens may be clinically indicated. Ideally, 2-3 lesions in different locations or at different stages are tested using separate swab(s) and tube(s) for each lesion.
   **Note: Ordering providers should consult the lab directly to confirm specimen requirements. Test collection materials themselves are not specialized and should be available in most clinical settings, but labs may have different submission requirements (i.e., testing media and swabs) and rejection criteria.*

See CDPH Mpox Guidance for information on clinical recognition and specimen collection.

Standardized co-infection testing
Co-infections have been common in this outbreak: CDC recommends sexually active persons being tested for mpox also be tested for HIV and sexually transmitted infections such as syphilis, herpes, gonorrhea, and chlamydia.

Clade-specific testing (for suspected Clade I MPXV)
If personal, partner, or household travel to the DRC within the past 21 days is reported by an individual being tested for mpox, additional clade-specific testing (i.e., differentiating between Clade I vs. Clade II MPXV) may be indicated. At this time, specimens collected from suspected Clade I MPXV cases should be processed through the local public health lab (rather than commercial labs) and forwarded to CDPH VRDL if the local public health lab does not have Clade I specific testing capacity. See CDPH Health Advisory: Clade I Mpox Virus with Geographic Spread in the Democratic Republic of the Congo: Recommendations for California Health Care Providers 12/11/2023 and CDPH VRDL Test Order: PCR for Monkeypox Virus Detection.

Surveillance Case Definitions and Reporting

See Case Definitions for Use in the 2022 Mpox Response | Mpox | CDC for up-to-date case definitions, epidemiologic criteria, and exclusion criteria.

Mpox case
- **Suspect mpox case:** New characteristic rash OR meets one of the epidemiologic criteria and has a high clinical suspicion for mpox
- **Probable mpox case:** No suspicion of other recent *Orthopoxvirus* exposure (e.g., *Vaccinia virus* in ACAM2000 vaccination) AND demonstration of the presence of:
  - □ *Orthopoxvirus* DNA by PCR of a clinical specimen OR
  - □ *Orthopoxvirus* using immunohistochemical or electron microscopy testing methods OR
  - □ Demonstration of detectable levels of anti-*Orthopoxvirus* IgM antibody during the period of 4 to 56 days after rash onset
- **Confirmed mpox case:** Demonstration of the presence of MPXV DNA by PCR testing OR Next-Generation sequencing of a clinical specimen OR isolation of MPXV in culture from a clinical specimen

Mpox reinfection
- **Suspect mpox reinfection case:** A case that fits the clinical description of mpox reinfection (a confirmed or probable case with recurrence of mpox symptoms after complete resolution of the initial infection) AND meets any of the following criteria:
  - □ New rash OR meets one of the epidemiologic criteria and has a high clinical suspicion for mpox

- **Probable reinfection case:** A case that meets the criteria for suspect mpox reinfection case AND demonstrates one of the following from a patient specimen:
  - □ *Orthopoxvirus* or MPXV DNA by PCR of a clinical specimen OR
  - □ *Orthopoxvirus* using immunohistochemical or electron microscopy testing methods OR
  - □ Demonstrable increase in anti-*Orthopoxvirus* IgG antibodies in paired serum samples collected within 3 days of symptom onset and 7-14 days after symptom onset, for patients with no prior mpox/smallpox vaccination or vaccinated ≥180 days prior to symptom onset
- **Confirmed mpox reinfection case:** A case that meets criteria for a probable mpox reinfection case AND has significant single nucleotide polymorphisms (SNPs) or genetic variation between MPXV genetic sequences from clinical specimens obtained from two or more episodes of MPXV infection separated by complete resolution of symptoms between episodes

Interim mpox reinfection reporting

- ✓ Create new incident ID for suspected reinfection cases and attach ELR
- ✓ Assess for case criteria per CDC definition (i.e., confirm with case if there was symptom resolution between incidents) and note "reinfection" with the primary infection incident ID in the notes tab
- ✓ Forward specimens that may meet reinfection criteria to CDPH VRDL for whole genome sequencing
- ✓ Send secure email to stdcb@cdph.ca.gov

Mpox death reporting

Death certificates should be used for public health surveillance in CalREDIE (i.e., if mpox is listed as a primary or significant contributing factor). See CDC MMWR: Epidemiologic and Clinical Features of Mpox-Associated Deaths—United States, May 10, 2022-March 7, 2023.

Case and Contact Investigation

Home isolation

Individuals with confirmed or suspected mpox should follow Isolation and Infection Control At Home | Mpox | CDC. Persons unable to work due to an illness may be eligible for paid leave or short-term disability; see CDPH Mpox Q&A for more information.

Investigation of cases, clusters, and outbreaks

For up-to-date guidance and recommendations on mpox case and cluster investigation, see *Mpox Case and Cluster Investigation Protocol for Local Health Departments* on the LHJ SharePoint. For consults or to request LHJ SharePoint access: mpoxadmin@cdph.ca.gov.

Community exposures and contacts

Persons who have been exposed to mpox are advised to self-monitor for symptoms for 21 days from last exposure and seek care for testing if symptoms develop. See Mpox Monitoring and Risk Assessment for Persons Exposed in the Community | Mpox | CDC.

JYNNEOS vaccine is recommended as post-exposure prophylaxis (PEP) for asymptomatic, unvaccinated persons with higher risk exposures—most commonly sexual contacts, household contacts, and some exposed healthcare workers. PEP is most effective at preventing mpox if administered *within four days of exposure*; if given 4-14 days after exposure, vaccination may help reduce symptoms but might not prevent infection from developing. LHJs should assist contacts with obtaining timely PEP.

Cases in healthcare and other ATD-covered settings

Full PPE (gown, gloves, eye protection and fit-tested N95 or higher) should be worn when caring for patients with suspected or confirmed mpox. See Infection Prevention and Control in Healthcare Settings | Mpox | CDC.

Mpox is an aerosol transmissible disease covered by the Cal/OSHA Aerosol Transmissible Diseases Standard (ATD) and applicable settings should consult those regulations for additional requirements. See Protecting Workers from Mpox for Employers and Workers Covered by the Aerosol Transmissible Diseases Standard (Title 8 Section 5199) (PDF) for more information including precautions, healthcare worker exposure management, and other requirements per the standard.

Cases in congregate settings

There is potential risk of mpox transmission in congregate living settings, which include correctional facilities, homeless shelters, residential substance use treatment facilities, and other similar settings. After establishing an isolation plan, LHJs should assess facility risk and consider the need for broader scale interventions, such as JYNNEOS PEP, on a case-by-case basis (e.g., feasibility of contact tracing, exposure risk, etc.) and contact CDPH for consultation. See CDPH Mpox Guidance for Congregate Living Settings and Considerations for Reducing Mpox Transmission in Congregate Living Settings | Mpox | CDC.

Cases in schools and childcare facilities

K-12 schools and childcare facilities should follow their everyday operational guidance that reduces transmission of infectious agents. Children with rashes of unknown origin should be evaluated for other more common etiologies of pediatric rashes—especially if no known risk of mpox exposure. See CDPH Mpox Considerations for Childcare and School Settings and contact CDPH for consultation as needed.

CDPH Consultation

The CDPH mpox team is available for consultation and support at mpoxadmin@cdph.ca.gov. See CDPH Mpox Guidance for other mpox resources and guidance for providers, local health departments, and laboratories.