Red Book Online Outbreak: Monkeypox (mpox) Outbreak

February 16, 2024

Article type: Resources

Topics: Infectious Diseases

Summary

In the United States, cases of mpox (formerly monkeypox) have declined since peaking in August 2022, but **small clusters have continued to occur. Severe mpox manifestations, including deaths, also continue to occur.** On February 12, 2024, the CDC issued a COCA Now alert urging mpox vaccination for those eligible given continued US mpox cases. In October 2023, the Advisory Committee on Immunization Practices recommended that people 18 years and older who are at risk or potential risk for mpox receive two doses of the JYNNEOS vaccine 28 days apart. The vaccine is safe and effective in preventing or minimizing the severity of mpox.

As of January 10, 2024, there have been 31,894 confirmed cases of mpox and 57 deaths in the US. This outbreak is part of a larger global outbreak (93,497 cases) that is occurring in 118 locations (countries, territories, and areas) and is caused by clade II (the West African clade) of mpox. The risk of children getting infected with mpox virus is low. As of January 10, 2024, 64 cases have been reported in children 0-15 years old and 699 cases have been reported in adolescents/young adults 16- 20 years old in the US. The highest proportion of cases by race and ethnicity have been reported in people who are Black or African American (32%), Hispanic or Latino (31%), or White (29%). See https://www.cdc.gov/poxvirus/response/2022/demographics.html for more information on mpox case demographics.

Clinical Guidance

- **Presentation:** mpox should be suspected in patients presenting with a rash consistent with mpox (https://www.cdc.gov/poxvirus//clinicians/clinical-recognition.html), especially (but not solely) in patients with exposure to someone known to have or suspected to have mpox. Clinical judgement and consultation with an infectious disease specialist and/or your local public health department is important in determining who needs testing, as the overwhelming majority of children who present with a rash will have an alternative etiology.
  - The rash associated with mpox produces macules that progress to papules, vesicles, and then pustules that are deep-seated, firm or hard, and well-circumscribed; the lesions may umbilicate or become confluent and progress over time to scabs. Rash may spread to other parts of the body. In classic mpox, lesions on a particular body part are in the same stage. This has not always been the case in the current outbreak, with lesions in varying stages of progression being seen in many patients in the US currently, and lesions may be few in number, and limited to one area.
  - Presenting symptoms typically include fever, chills, malaise, sore throat, headache, and new lymphadenopathy, followed by the distinctive rash. In the current outbreak, onset of perianal or genital lesions in the absence of fever or other systemic symptoms or concurrently with systemic symptoms also has been reported. Other symptoms include difficulty swallowing or cough when oropharyngeal lesions are present. Ocular lesions may present with eyelid swelling or crusting.
  - The rash associated with mpox can be confused with other diseases that are more commonly encountered in clinical practice (eg, syphilis, herpes simplex virus [HSV], chancroid, varicella zoster, and molluscum contagiosum). In addition, some patients have been coinfected with syphilis or HSV and mpox. A high index of suspicion for mpox is warranted when evaluating patients with a new onset of clinically compatible rash, who present with lesions in the genital/perianal area or for patients who had contact with a suspected or known case of mpox.
  - Pediatricians can review the case definition of mpox for more information.

- **Diagnosis:** If a patient is suspected of having mpox, the clinician should contact the health department to discuss testing or may use one of the commercial laboratories discussed below. Some academic centers also have the capacity to test for mpox virus. Testing at a designated laboratory response network (LRN) laboratory or a commercial laboratory is generally with an orthopoxvirus PCR test (diagnostic process for mpox virus testing). A positive orthopoxvirus PCR in a patient suspected of mpox is sufficient to consider the patient as having mpox, and public health officials will initiate an investigation and provide recommendations. Clinicians may order testing at commercial labs without prior authorization from public health authorities. Testing is performed on skin lesion material (dry swab, swab placed in viral culture media, or crusts) or mucosal lesion material. Requirements for specimen collection may differ by laboratory and clinicians should confirm requirements before obtaining a sample. Unroofing or aspiration of lesions during specimen collection or using sharp instruments for mpox lesion testing is not necessary or recommended due to the risk for sharps injury. Testing on blood or other body fluids is not available. For information on testing specimens that will be sent to an LRN laboratory see Preparation and Collection of Specimens | mpox | Poxvirus | CDC. Clinicians should be

aware that false positive tests have occurred in patients (including children) who were at low risk, without a known epidemiological link, and who had a high cycle threshold value (https://www.cdc.gov/mmwr/volumes/71/wr/mm7136e1.htm).

- **Complications:** Patients with mpox can develop a variety of complications, including encephalitis, encephalomyelitis, pneumonia, sepsis, hemorrhagic disease, myocarditis, pericarditis, other conditions requiring hospitalization, blindness (secondary to ocular infection), and bacterial skin infections. If the patient is pregnant, there may be complications, including preterm delivery, fetal death, or congenital disease; data are very limited. For more information: Monitoring People Who Have Been Exposed | mpox | Poxvirus | CDC
- **Precautions:** mpox spreads person to person primarily through contact with infectious rashes, prolonged face-to-face contact, or items that previously touched the infectious rash or body fluids. Standard precautions should be applied for all patient care, including for patients with suspected mpox. If a patient seeking care is suspected to have mpox, infection prevention and control personnel should be notified immediately. In the inpatient setting, persons with suspected or confirmed mpox should be placed in a single patient room with a dedicated bathroom. Special air handling for mpox is not required except during aerosol-generating procedures (although airborne isolation is required for some infections associated with rash, such as varicella or measles). Intubation, extubation, and any procedure likely to spread oral secretions should be performed in a negative pressure isolation room. In ambulatory healthcare settings, the lesions of patients with suspected or confirmed mpox should be covered and patients who are at least 2 years of age should be masked. Patients should be put in an exam room promptly. In both inpatient and ambulatory settings, the PPE used by healthcare personnel who enter the patient's room should include a gown, gloves, eye protection (ie, goggles or face shield), and a NIOSH-approved particulate respirator equipped with N95 filters or higher. For more information, see How it Spreads | mpox | Poxvirus | CDC.
- Standard cleaning and disinfection procedures should be performed using an EPA-registered hospital-grade disinfectant with an emerging viral pathogen claim. Products with Emerging Viral Pathogens claims may be found on EPA's List Q. Follow the manufacturer's directions for concentration and contact time. Activities that could resuspend dried material from lesions (eg, use of portable fans, dry dusting, sweeping, or vacuuming) should be avoided. Waste contaminated with mpox virus associated with this outbreak in the United States, clade II (West African clade [PDF – 4.06 MB]) of mpox virus, including disposable PPE, should be managed as UN3291 Regulated Medical Waste (RMW) in the same manner as other potentially infectious medical waste (eg, soiled dressings, contaminated sharps). Waste from individuals who have risk factors for clade 1 (the Congo Basin clade) of mpox (eg, history of travel to the Democratic Republic of the Congo, the Republic of Congo, the Central African Republic, Cameroon, or Gabon in the prior 21 days) must be managed as Category A waste pending clade confirmation.
- **Risk Mitigation:** Children and adolescents with mpox who do not require hospitalization should be isolated at home. Infected persons should avoid contact with uninfected people and pets until the rash has resolved, the scabs have fallen off, and a fresh layer of intact skin has formed. When possible, the number of caregivers should be limited to one person who has been educated about infection prevention strategies. Caregivers should wear a respirator or well-fitting face mask, cover areas of broken skin with bandages and clothing to the extent possible and avoid direct skin-to-skin contact with the rash. During interactions with uninfected caregivers, children over 2 years of age with mpox should wear well-fitting source control (eg, a medical mask) when possible. Caregivers assisting with changing bandages or clothes covering the rash should wear gloves to avoid infection, dispose of gloves after use and perform handwashing.
    - Decisions regarding discontinuation of isolation precautions at a healthcare facility and at home should be made in consultation with the local or state health department. For patients with mpox, isolation precautions are recommended to continue until all lesions have resolved, the scabs have fallen off, and a fresh layer of intact skin has formed. For questions about home isolation for individual patients and circumstances, discussion with local or state health departments is recommended. For more information: Isolation and Infection Control: Home | mpox | Poxvirus | CDC and Isolation and Prevention Practices for People with mpox | mpox | Poxvirus | CDC
        - CDC recommends that people whose jobs (clinical or research laboratories and certain healthcare and public health team members) may expose them to orthopoxviruses, such as mpox, get vaccinated with JYNNEOS or ACAM2000 to protect them from an orthopoxvirus infection. At this point, vaccination is not recommended for most healthcare providers. For more information: mpox and Smallpox Vaccine Guidance | mpox | Poxvirus | CDC
        - Vaccination is also recommended for people at highest potential for exposure to mpox. As of September 28, 2022 (https://www.cdc.gov/poxvirus//interim-considerations/overview.html#:~:text=Currently%2C%20CDC%20is%20not%20recommending,vaccination%20efforts%20should%20remain%20focused), this includes:
            - Gay, bisexual, and other men who have sex with men, transgender, or nonbinary people who in the past 6 months have had
                - A new diagnosis of one or more nationally reportable sexually transmitted diseases (ie, acute HIV, chancroid, chlamydia, gonorrhea, or syphilis)
                - More than one sex partner
            - People who have had any of the following in the past 6 months:
                - Sex at a commercial sex venue
                - Sex in association with a large public event in a geographic area where mpox transmission is occurring
            - Sexual partners of people with the above risks
            - People who anticipate experiencing the above risks
        - Please refer to CDC or state public health website, as recommendations for vaccine may expand, depending on the supply.
        - Public health officials may recommend vaccine for contacts of mpox cases, especially those that are found to be at high risk. Healthcare providers who have unprotected, high risk contact with patients with mpox may be eligible for post-exposure prophylaxis in consultation with public health authorities.
        - The standard regimen for JYNNEOS vaccine is a 0.5 mL dose administered subcutaneously followed by a second dose 28 days later. CDC has recommended an alternative dosing regimen for persons 18 years and older (who do not have a history of developing keloid scars) of 0.1 ml administered intradermally followed by a second dose 28 days later. This dosing is recommended in order to have an adequate vaccine supply and is under an emergency use authorization protocol.
        - JYNNEOS vaccine may be recommended for and given to children <18 years of age for post-exposure prophylaxis under an emergency use authorization protocol. Clinicians should discuss use of vaccine in a child as post-exposure prophylaxis with the state or local health department. Only subcutaneous administration of JYNNEOS vaccine is authorized for children <18 years of age.
        - Vaccinia immune globulin is available through an IND protocol for the potential prevention of mpox, but its effectiveness is unknown. Vaccinia immune globulin is an alternative to vaccine for post-exposure prophylaxis, especially in children <6 months of age.
        - Tecovirimat may be considered for post-exposure prophylaxis when vaccine is contraindicated; its effectiveness is unknown.
- **Treatment:** mpox is typically a self-limiting condition. Some patients are at higher risk for severe disease and should be considered for treatment on a case-by-case basis, including immunocompromised patients, pregnant or breastfeeding persons, children under 1 year, and those with atopic dermatitis or another condition that affects skin integrity. In addition, those with complicated or severe disease, or with lesions in the areas

that might result in severe sequelae, including scarring and strictures (eye, mouth, genitals, or anus/rectum), should be considered for treatment. For more information, see https://www.cdc.gov/poxvirus//clinicians/treatment.html. Consultation with an infectious disease expert is recommended. State or local public health officials can facilitate consultation access to antiviral therapy. There is no treatment approved specifically for mpox virus infections. However, antivirals developed for use in patients with smallpox may prove beneficial against mpox. The following medical countermeasures are available from the Strategic National Stockpile (SNS) as options for the treatment of mpox:

- Tecovirimat (also known as TPOXX, ST-246), developed for treatment of smallpox, is being used as a first-line treatment for patients weighing 3 kg or more through an expanded access protocol for mpox (see package insert: label [fda.gov]). Oral dosing is most feasible for children who weigh at least 13 kg and can take capsules, or the contents of a capsule mixed with soft food. The drug should be administered with a fatty meal to increase absorption. Because accurate oral dosing of children <13 kg is challenging, intravenous therapy may be considered when tecovirimat is indicated. Renal immaturity in patients <2 years of age may result in higher exposure to hydroxypropyl-β-cyclodextrin, an ingredient in intravenous tecovirimat. In animal studies, hydroxypropyl-β-cyclodextrin demonstrated the potential for nephrotoxicity at high levels. At least weekly monitoring of renal function is indicated in children and adolescents receiving intravenous tecovirimat. Tecovirimat has not been studied in children to date. Evidence of efficacy in the treatment of mpox is based largely on animal studies. The potential risks and benefits should be considered prior to initiating therapy.
- CDC has an expanded access protocol for Vaccinia Immune Globulin Intravenous (VIGIV) in the case of a mpox outbreak (download [fda.gov]). Effectiveness is unknown.
- The use of antiviral medications cidofovir and brincidofovir may also be considered, but these should be used with caution due to potential toxicity and very limited experience with mpox.
  - Cidofovir (also known as Vistide), which is approved for CMV retinitis, has an expanded access protocol for treatment of mpox (FDA VISTIDE cidofir injection).
  - Brincidofovir (also known as CMX001 or Tembexa), which is approved for smallpox treatment (FDA TEMBEXA brincidofovir) is now available in the SNS through an expanded access investigational new drug protocol for mpox by CDC.

- **Reporting and assistance:** Clinicians should report cases to state or local health departments (State Contacts) as soon as mpox is suspected. If you have a patient that meets the probable or confirmed case definition, the health department will notify CDC. For more information, see Case Reporting Recommendations for Health Departments | mpox | Poxvirus | CDC

See **Special Populations** for the management of newborns infected with mpox virus.

Resources

- For more information see the *Red Book* chapter: Smallpox (Variola)
- CDC Health Advisory Notice from May 20, 2022: HAN Archive - 00466 | Health Alert Network (HAN) (cdc.gov)
- CDC Health Advisory Notice from June 14, 2022: HAN Archive - 00468 | Health Alert Network (HAN) (cdc.gov)

Pediatric Practice Tools and Info

AAP News: Frequently Asked Questions: mpox

CDC: Information For Healthcare Professionals

CDC: Clinical Considerations for mpox in Children and Adolescents | mpox | Poxvirus

CDC: Clinical Considerations for mpox in People Who are Pregnant or Breastfeeding

Resources for Schools and Child Care

CDC: Schools, Early Care and Education Programs, and Other Settings Serving Children or Adolescents | mpox | Poxvirus

CDC: mpox Toolkit for K-12 Schools and Early Childhood Education

Public Health Resources

CDC case count: 2022 US mpox Outbreak: Situation Summary | mpox | Poxvirus

CDC US map of cases: 2022 US Map & Case Count | mpox | Poxvirus

CDC global map of cases: 2022 mpox Outbreak Global Map | mpox | Poxvirus

CDC health department: 2022 mpox: Information for Health Departments | mpox | Poxvirus

Infection Prevention and Control Resources

CDC: Infection Prevention and Control of mpox in Healthcare Settings | mpox | Poxvirus

AAP: Project Firstline

Information for Patients and Caregivers

AAP HealthyChildren.org: What is monkeypox? | Spanish: ¿Qué es la viruela del mono o viruela símica? ¿Debo preocuparme?

CDC: mpox factsheet for adolescents and young adults