Update for Clinicians on Monkeypox in People with HIV, Children and Adolescents, and People who are Pregnant or Breastfeeding

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Summary
As of July 29, 2022, the Centers for Disease Control and Prevention (CDC) and state and local public health partners are reporting 5,189 cases of *Monkeypox virus* infections in the United States across 47 states, Washington, D.C., and Puerto Rico. CDC is also reporting multiple outbreaks of monkeypox have also been reported globally in 72 countries that do not normally report monkeypox activity. On Friday, July 22, CDC reported the first two cases of monkeypox in children in the United States during the current outbreak.

This Health Alert Network (HAN) Health Update serves to alert clinicians to clinical considerations for preventing, diagnosing, and managing monkeypox in people with HIV, children, adolescents, and people who are pregnant or breastfeeding.

Background
Since May 2022, CDC has been urging healthcare providers in the United States to be on alert for patients who have rash illnesses consistent with monkeypox. People with HIV, individuals who are immunocompromised, children, adolescents, and people who are pregnant or breastfeeding may be at risk for increased disease severity and adverse health outcomes associated with monkeypox infection. Clinicians should be familiar with unique clinical considerations for monkeypox in these patient populations. A broad diagnostic approach is encouraged to distinguish *Monkeypox virus* infection from other causes of fever and rash illness. Testing should be performed on persons for whom monkeypox is suspected based on clinical presentation or epidemiologic criteria. Clinicians should consult their state or territorial health department (State Contacts) or CDC through the CDC Emergency Operations Center (770-488-7100) as soon as monkeypox is suspected.

CDC has issued clinical considerations for monkeypox infection in multiple populations including: people with HIV, children and adolescents, and people who are pregnant or breastfeeding. These newly released clinical considerations complement existing clinical guidance for managing monkeypox and provide information on signs and symptoms of *Monkeypox virus* infection; pre- and post-exposure prophylaxis; treatment; and infection control in these populations.

Recommendations and Information for Healthcare Providers on Monkeypox in People with HIV
In the current outbreak, available international summary surveillance data in the CDC-issued clinical considerations for people with HIV indicate 30-51% HIV prevalence among persons with monkeypox for whom HIV status was known. It is currently unknown whether HIV infection affects a person's risk of acquiring *Monkeypox virus* infection and developing disease after exposure.

Persons with advanced and uncontrolled HIV might be at higher risk for severe or prolonged monkeypox disease. Therefore, prophylaxis (e.g., vaccination), medical treatment and close monitoring are a priority for this population. Compared with other persons with monkeypox, case reports among persons with inadequately treated HIV who have CD4 counts ≤350 per mm3 reported higher rates of secondary bacterial infection, more prolonged illness (and thereby also longer period of infectiousness), as well as a higher likelihood of a confluent or partially confluent rash, rather than discrete lesions. In contrast, recent reports of patients with HIV infection and monkeypox who are on effective antiretroviral therapy (ART) have noted no deaths or evident excess hospitalizations to date. Providers should consider both viral suppression and CD4 count

in weighing the risk of severe outcomes from monkeypox for any patient with HIV.
The rash of monkeypox can be confused with other rash illnesses that are considered in people with HIV, including herpes zoster (shingles), scabies, molluscum contagiosum, herpes, syphilis, chancroid, lymphogranuloma venereum, allergic skin rashes, and drug eruptions. Immunocompromised persons, including persons with advanced, untreated or inadequately suppressed HIV, may present with an atypical rash, including a disseminated rash that may make diagnosis more challenging.

Prevention of monkeypox and infection control practices in the home or healthcare setting are the same regardless of peoples' HIV status. Post-exposure prophylaxis (PEP) and antiviral treatments, including tecovirimat, are available for persons exposed to monkeypox or with *Monkeypox virus* infection. The safety and immunogenicity of JYNNEOS, a live, non-replicating viral vaccine, has been specifically established in people with HIV; however, immunogenicity among persons with HIV who have CD4 counts below 100 cells/mm3 or who are not virologically suppressed remains unknown. ACAM2000, a replicating viral vaccine, should not be given to people with HIV (regardless of immune status). Antiviral treatments for monkeypox have few interactions with antiretroviral therapy. ART and opportunistic infection prophylaxis should be continued in all people with HIV who develop monkeypox.

Recommendations and Information for Healthcare Providers on Monkeypox in Children and Adolescents
Limited pediatric data on infection with the Congo Basin clade of *Monkeypox virus* suggest increased risk of severe disease in children younger than 8 years of age. Rare complications of monkeypox include abscess, airway obstruction due to severe lymphadenopathy, cellulitis, corneal scarring, encephalitis, keratitis, pneumonia, and sepsis. The West African clade of *Monkeypox virus* involved in the current outbreak typically causes less severe disease than the Congo Basin clade.

Monkeypox virus can spread to children through contact with infectious body fluids (e.g., lesion exudates and respiratory secretions) of people or animals or through contact with fomites, as may occur in households and other close contact settings. The number of monkeypox cases among children in the United States is currently low; however, CDC acknowledges that the expanding U.S. outbreak and the possible risk for transmission in households and other settings may result in additional pediatric cases. Pediatric providers should be familiar with prevention, recognition, and testing considerations for monkeypox in children and adolescents.

Families should be counseled about preventing the spread of *Monkeypox virus* between children, caregivers, and household members in the home, including avoidance of contact with persons who have monkeypox, the body fluids of an infected person, and fomites (e.g., clothing, towels, bedding); wearing a well-fitting mask or respirator by the person with monkeypox and the contact (for children over 2 years of age) when interaction is unavoidable; and minimizing the number of caregivers for children with monkeypox. Particular attention should be made to keep children with monkeypox from scratching lesions or touching their eyes to prevent auto-inoculation and more severe illness. Caregivers should cover areas of broken skin with bandages to the extent possible and avoid direct skin-to-skin contact with the rash.

Children and adolescents who are close contacts of a person with monkeypox (e.g., household contact, other family member, caregiver, or friend) should be evaluated for illness and offered post-exposure prophylaxis with JYNNEOS or ACAM2000 (for children older than 12 months) or treatment when indicated. Monkeypox should be considered when children or adolescents present with signs or symptoms that could be consistent with the disease, especially if epidemiologic criteria are present. The rash of monkeypox can be confused with other rash illnesses that are commonly considered in children including varicella (chickenpox); hand, foot, and mouth disease; measles; scabies; molluscum contagiosum; herpes; allergic skin rashes and syphilis (including congenital syphilis); and drug eruptions.

Data are limited on the effectiveness of PEP for children who have been exposed to monkeypox or treatment for children with illness, and no vaccines or other products are currently licensed for monkeypox prevention or treatment in children or adolescents. However, PEP should not be withheld from children or adolescents who are otherwise eligible. Decisions about whether to offer PEP should take into account the patient's degree of exposure and the patient's individual risk of severe disease.

Prophylactic therapeutics that can be administered include vaccination, Vaccinia immune globulin, and antiviral medication. For almost all children and adolescents, vaccination is the preventive treatment that should be administered. Immune globulin or antivirals may also be considered for infants under 6 months of age, given their immature immune systems and possible decreased responses to vaccination.

Tecovirimat is currently being used as the first-line treatment for infection with *Monkeypox virus*, including for children and adolescents with severe disease or underlying medical conditions that may increase risk for severe disease and those with complications from monkeypox. Individual risks and benefits must be considered prior to initiating tecovirimat. Other treatments such as Vaccinia immune globulin may be considered in unusual circumstances.

In pediatric inpatient care settings, infection control procedures for children with monkeypox infection should also consider the child's age and caregiving needs; family and caregiver preferences; the extent, severity, and course of the child's illness; and risks for severe monkeypox disease in exposed caregivers (e.g., pregnancy or immunocompromising conditions).

Recommendations and Information for Healthcare Providers on Monkeypox in People who are Pregnant or Breastfeeding

Data regarding *Monkeypox virus* infection during pregnancy are limited. It is unknown if pregnant people are more susceptible to acquiring *Monkeypox virus* infection or if illness is more severe during pregnancy. Other poxviruses cause more severe infection during pregnancy. *Monkeypox virus* can be transmitted to the fetus during pregnancy and to the newborn by close contact during and after birth. There are few case reports of spontaneous pregnancy loss and stillbirth, preterm delivery, and neonatal monkeypox infection; the frequency and circumstances for these outcomes are unknown. Whether *Monkeypox virus* is present in breast milk is unknown; however, it may be transmitted through close contact during breastfeeding.

Prevention measures for monkeypox infection are similar for pregnant and non-pregnant people. Pre- or post-exposure prophylaxis should be offered to people who are pregnant or breastfeeding. When pre- or post-exposure prophylaxis by vaccination is chosen, JYNNEOS, a live, non-replicating viral vaccine, can be used. ACAM2000, a replicating viral vaccine, should not be used in people who are pregnant or breastfeeding.

During pregnancy, the cause of fever may be difficult to differentiate from other infections, such as intraamniotic infection (chorioamnionitis), until the monkeypox rash appears. Pregnant patients with rashes initially considered characteristic of dermatoses of pregnancy (e.g., polymorphic eruption of pregnancy) or of more common infections (e.g., varicella zoster or sexually transmitted infections) should be carefully evaluated for a monkeypox rash, and submission of specimens of lesions for monkeypox diagnosis should be considered, especially if the person has any epidemiologic risk factors for monkeypox infection.

While most adults with *Monkeypox virus* infection experience self-limiting infection and recover within 2–4 weeks, pregnant and breastfeeding people should be prioritized for medical treatment, if needed, due to the probable increased risk of severe disease during pregnancy, risk of transmission to the fetus during pregnancy or to the newborn by close contact during and after birth, and risk of severe infection in newborns. Treatment for *Monkeypox virus* infection should be offered to people who are pregnant or breastfeeding. The risks and benefits of treatment options should be discussed with the patient.

Recommendations for infection prevention and control of monkeypox in healthcare settings are the same for pregnant and non-pregnant patients. Newborns born to people with monkeypox should be placed in isolation, and healthcare personnel should follow infection prevention and control recommendations. Patients with monkeypox should be counseled about measures to prevent risk of transmission of *Monkeypox virus* to their newborn from close contact and breastfeeding.

For More Information

- Clinical Considerations for Monkeypox in People Who are Pregnant or Breastfeeding | Monkeypox | Poxvirus | CDC
- Clinical Considerations for Monkeypox in Children and Adolescents | Monkeypox | Poxvirus | CDC
- Clinical Considerations for Treatment and Prophylaxis of Monkeypox virus Infection in People with HIV | Monkeypox | Poxvirus | CDC
- Visit CDC-INFO or call CDC-INFO at 1-800-232-4636
- CDC 24/7 Emergency Operations Center (EOC) 770-488-7100

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DEPARTMENT OF HEALTH AND HUMAN SERVICES

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