Monkeypox numbers, treatment and prevention with two CDC experts

AMA's Moving Medicine video series amplifies physician voices and highlights developments and achievements throughout medicine.

Featured topic and speakers

Two experts from the CDC’s Division of High-Consequence Pathogens & Pathology in Atlanta, Caroline Schrodt, MD, and Jennifer McQuiston, DVM, talk with American Medical Association Chief Experience Officer Todd Unger about what physicians need to know about monkeypox, including the latest numbers, how it's spread, vulnerable populations, common symptoms and available treatments and testing. For up-to-date information, visit the CDC.

Monkeypox resources

- Information for professionals
- Specific FAQs for clinicians
- Most recent Health Alert Network (HAN)
- Considerations for Monkeypox vaccination
- General information on Monkeypox, including current case counts
- AMA resource: Physician FAQs

Find additional resources at the Monkeypox resource center.

Speakers

- Caroline Schrodt, MD, clinical guidance team co-lead, Clinical Task Force, CDC Multi-National Monkeypox Response
- Jennifer McQuiston, DVM, incident manager, CDC Multi-National Monkeypox Response

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Transcript

**Unger:** Hello. This is the American Medical Association's Moving Medicine video and podcast. You can also find this episode on the COVID-19 Update podcast channel as well. We're getting so many questions here at the AMA about monkeypox. We're here to answer those questions today about this important disease that's spreading throughout the country.

I'm joined today by two special experts from the CDC's Division of High-Consequence Pathogens & Pathology in Atlanta. Dr. Caroline Schrodt an emergency medicine physician and current clinical guidance team co-lead for the Clinical Task Force of the CDC's Multinational Monkeypox Response. Dr. Schrodt is also a lieutenant commander in the U.S. Public Health Service. And Dr. Jennifer McQuiston, a doctor of veterinary medicine and the incident manager of the CDC's Multinational Monkeypox Response. She's also a captain in the U.S. Public Health Service.

I'm Todd Unger, AMA's chief experience officer in Chicago. We're certainly seeing no shortage of headlines and news about monkeypox. But there has been a lot of confusion, a lot of questions about the disease from both physicians and patients. Dr. McQuiston, I'd like you to start by telling us the facts about where we stand right now in terms of known cases in the U.S. and how quickly it seems to be spreading.

**Dr. McQuiston:** Thank you so much for having us on. The first case was confirmed in the United States on May 17. And as of yesterday in the U.S., there are now 929 confirmed and probable cases across 42 states or territories in the District of Columbia. So we are actively seeing spread of the virus within the United States.

Worldwide there are 10,611 confirmed cases that we're aware of in 65 countries. And of those, about 10,388 are in non-endemic countries, 59 non-endemic countries. So those are the places we would not normally expect to see monkeypox. I do think it's important to say that U.S. surveillance numbers likely undercount cases because detection really depends on a lot of factors, including patients presenting for care, clinicians thinking about monkeypox when they're seeing patients and then also requesting and having access to diagnostic tests.

We're really working to increase the availability of doctors to access testing. Just want to say commercial laboratory testing is now available at several major laboratories. And we're encouraging broader testing of patients who present with lesions or other symptoms that might suggest they should be suspected for monkeypox.

I think it's important to say U.S. cases are increasing daily. Our outbreak curve is in a period of acceleration and it mirrors what has been seen in some other European countries, including the...
United Kingdom, Spain and Portugal. The new outbreak does look like it’s a couple of weeks behind Europe’s acceleration curve. And it may be that our outbreak really began in earnest several weeks after Europe’s.

And as I mentioned the number of cases we’re seeing daily shows us there is community spread occurring. And while public health officials are working around the clock to contain the outbreak, it’s important to say that I think we expect that these numbers will continue to increase.

**Unger:** Thanks, Dr. McQuiston. Dr. Schrodt, while most physicians are certainly familiar with monkeypox, it’s not something they would typically expect to see in everyday practice. Can you give us a high-level overview of what causes this disease and how it typically progresses?

**Dr. Schrodt:** Of course, and thank you for having us on the show, Todd. So monkeypox is a rare disease caused by infection with the monkeypox virus. Monkeypox virus belongs to the genus orthopoxvirus, which also includes the causative agent of smallpox variola virus, as well vaccinia virus which is the virus used in the smallpox vaccines. While monkeypox causes similar symptoms as smallpox, the morbidity and mortality are lower.

But it might help to understand that there are actually two viral genetic groups or clades of monkeypox virus which have differing mortality rates. So we see up to 11% mortality for the Congo Basin or central African clade and less than 1% for the west African clade. Although the 11% mortality rate was noted in individuals without prior smallpox vaccination, and the west African clade, which has the lower mortality rate is the virus that is currently circulating in non-endemic countries like the United States.

**Unger:** What specific symptoms should physicians and patients be watching for? Have we seen this disease evolve at all with the current outbreak?

**Dr. Schrodt:** So monkeypox usually presents with a prodromal period characterized by influenza like illness, fever and lymphadenopathy, and is followed by a rash, all of which typically lasts two to four weeks. The lesions can be localized or disseminated and progress through several stages, usually all at the same time prior to scabbing over and falling off. Historically, the lesions are well-circumscribed, deep seated and sometimes umbilicated.

The lesions can be debilitating painful, though patients often describe them as itchy once they are scabbed over and healing. Interestingly, Todd, during this outbreak some patients are presenting with a rash before the other associated symptoms. And contrary to the characteristic rash I just described, some patients have lesions isolated to the genitals or anus and some might have very few lesions that might initially be confused with pimples, ingrown hairs or blisters.
For this reason, clinicians should perform a thorough skin exam including oral, anal or vaginal mucosa to look for skin lesions or rash that might be consistent with monkeypox. And another important consideration is that co-infection has been reported with monkeypox and other infectious agents that can cause a rash, which includes sexually transmitted infections or STIs. So the diagnosis of an STI does not exclude monkeypox, as a concurrent infection may be present. And we know that the clinical presentation of monkeypox may be similar to that of STIs like syphilis, herpes, lymph granuloma, venereum or other etiologies of proctitis.

So for this reason in people with epidemiologic risk factors, rashes initially considered characteristic of more common infections should be carefully evaluated for signs and symptoms consistent with monkeypox. And you might be wondering about the epidemiologic risk factors. So this includes anyone who, within the 21 days prior to illness onset, reports close or intimate contact with a person likely or confirmed to have monkeypox, or with individuals in a social network experiencing monkeypox activity.

So this includes men who have sex with men who meet partners through an online website, digital app or social events like a bar or party. And traditional epidemiologic risk factors also still apply, which include travel outside the United States to a country with confirmed monkeypox cases or where monkeypox virus is endemic, as well as contact with dead or live animals or animal products from African endemic species.

Unger: Thank you, Dr. McQuiston. I think the word testing popped up earlier in our discussion. We’ve heard the testing has been an issue since it was only initially available through the public health laboratories. What's the CDC doing to make testing more accessible and what do physicians and patients need to know about testing for monkeypox?

Dr. McQuiston: Thank you so much for that question. It is a really important issue. And I think CDC is working hard to try to make it be more accessible. The important thing is an untested monkeypox patient is an uncounted monkeypox patient and is someone who might be out there continuing to spread the virus.

So we definitely think that testing is one of the important cornerstones of our response. We’re working to increase awareness of testing capacity. We’re working to try to ease the access issue so that we can then get more people tested and then better understand how and why monkeypox is spreading in the United States.

So to raise awareness through clinician education with our Health Alert Network Notices or HANNs and several COCA calls that we’ve put on, we’ve put out information about clinical presentation, patient management, post-exposure prophylaxis, treatment options and how to test. Information about how to test is available in those clinician resources. Results from early testing are so important because it helps health care providers advise their patients about the steps they need to take to
prevent further spread.

And health officials can obtain information about people with whom the patient has had recent close contact with once testing is part of that equation, so it’s really important.

The U.S. has had testing capacity of up to 10,000 specimens per week in over 60 Laboratory Response Network laboratories or LRN laboratories. This is a really important cornerstone of the U.S. testing capacity that we have for bioterrorism agents, for emerging and unknown diseases.

But the thing is, is that a lot of clinicians are unfamiliar with them and aren’t comfortable using them. And we know that is one of the things that has resulted in less access or use. So on July 6 after work by CDC to transfer our assay to at least five different commercial laboratories, they’re standing up their testing as we speak. So on July 6, Labcorp began testing for monkeypox, which added another 10,000 per week to the U.S. capacity. And Mayo Clinic laboratories announced on July 11 that it was beginning testing. And there are three other commercial labs that are currently in the process of coming online as well.

And very soon that would bring U.S. testing capacity to at least 60,000 per week. We’ve also heard that one of those labs that’s working to bring on our assay test has set up their own monkeypox testing assay, so not even using only the CDC assay. So all these things combined we hope will dramatically expand testing capacity nationwide and make it more convenient and accessible for patients and clinicians within the coming weeks.

And I do want to caution that with that increased access, we’re going to see more cases. So we may see case counts rise and we need to be cognizant that these cases have probably been happening and this is our chance to detect them and then get prevention measures in place.

**Unger:** Just so important to do the testing and have those correct numbers. Dr. Schrodt, we’ve just been through COVID-19, a specific way of collecting the swabs. This is different obviously. How are swabs collected in this particular?

**Dr. Schrodt:** I’m so glad you asked. We’ve gotten this question a lot and it’s actually very easy. And so of course I recommend that clinicians refer to the instructions provided to them by their local or state health department, the testing laboratory or the instructions on the CDC website as this information could change. Generally, as of now, the second week in July, we recommend collecting two swabs from at least two different locations on the body or from lesions that differ in appearance.

So that means collecting at least four swabs from a single patient and maybe more. A variety of swabs can be used. But they must be sterile, synthetic swabs and cotton swabs should not be used. If you’re confused about which swab to use, I recommend clinicians use the same swab that is used to test someone for COVID-19. The swabs are a dry swab and for this reason lesions should be swabbed
vigorously to make sure enough DNA is collected.

Single swabs need to be placed in their own single container, which can either be an empty sterile container or into viral transport media. Other types of transport media should not be used however. So if you’re confused about which media to use I recommend just placing the swabs into empty sterile containers after collection prior to being stored in the laboratory refrigerator or freezer.

**Unger:** But once testing has confirmed a patient does indeed have monkeypox, what’s the current recommended course of treatment and is there enough supply to treat everybody who is infected?

**Dr. Schrodt:** So fortunately many people with monkeypox will get better without treatment. But there are antiviral therapies developed to protect against smallpox that may be used to treat monkeypox and are believed to be helpful for people with monkeypox. So this is important, especially for patients who have severe disease or who are at risk for severe disease, which includes children less than eight years of age, individuals who are pregnant or immunocompromised and individuals with a history of atopic dermatitis or eczema.

In addition, the antivirals may be considered along with vaccination to prevent development of monkeypox in people at risk for developing severe disease. So the three main antivirals that can be used are tecovirimat, which is also known as TPOXX, cidofovir and brincidofovir, although brincidofovir is not currently available from the strategic national stockpile. TPOXX is considered first line due to its favorable safety profile and its availability in oral form.

Additionally, vaccinia immune globulin intravenous or VIGIV, is licensed for treatment of complications due to vaccinia vaccination or infection but can also be used for treatment of monkeypox. And so the strategic national stockpile in the United States, which is managed by the Office of the Assistant Secretary for Preparedness and Response or OASPR has sufficient stock to meet the demand for both oral and intravenous forms of TPOXX. And as the use of TPOXX in humans prior to this outbreak is limited, CDC currently has an expanded access investigational new drug protocol which allows for the use of TPOXX for monkeypox.

Clinicians interested in providing treatment should contact their local or state health department, and clinical case consultations with CDC clinician subject matter experts are available 24/7 if desired to discuss cases and treatment.

**Unger:** Dr. Schrodt, what vaccines are available and what do we know about their effectiveness, side effects and availability at this point? And what is the vaccination strategy for monkeypox? Should everyone be getting preemptively vaccinated?

**Dr. Schrodt:** Thanks, Todd. The U.S. government has two stockpiled vaccines, JYNNEOS and ACAM2000. Both are believed to be about 85% effective at preventing monkeypox based on cross-
reactivity across Orthopox viruses but neither has been studied for post-exposure prophylaxis. So we do not have information on vaccine effectiveness for monkeypox in the specific context. So far in this outbreak, only JYNNEOS has been administered as post-exposure prophylaxis due to its improved safety profile.

Both vaccines actually contain live vaccinia virus. But the strain in JYNNEOS is non-replicating, which means that it does not cause infection in humans. JYNNEOS is administered as a two dose subcutaneous series with doses given 28 days apart, whereas ACAM2000 is administered as a single percutaneous dose using a bifurcated needle that leads to an infectious lesion at the site of vaccination, which can then be unintentionally spread to other parts of the body or even to other people.

As the vaccinia virus in JYNNEOS is non-replicating, it does not spread to other parts of the body or other people. And there are fewer adverse events or side effects associated with the JYNNEOS vaccine. As such, the JYNNEOS doses should be prioritized for people who are at risk for severe adverse events with ACAM2000 or severe disease from monkeypox such as people with immunocompromised conditions. And as with any vaccine, but especially since JYNNEOS is a newer vaccine, clinicians should report any adverse events that could be related to vaccination to the Vaccine Adverse Events Reporting System at VAERS.hhs.gov.

And CDC is not recommending preemptive vaccination of the general population. Nor is preemptive vaccination currently recommended for most clinicians in the United States and laboratorians unless, of course they're conducting orthopox virus lab testing. For post-exposure vaccination, we recommend vaccination of close contacts who have been exposed to someone with monkeypox.

And for preemptive vaccination or pre-exposure prophylaxis, vaccines are being allocated to jurisdictions in phases, with a current emphasis on vaccinating known contacts, presumed contacts or persons at increased risk of being a contact. And so state health departments should be consulted to arrange vaccination of individuals for whom it's indicated.

**Unger:** Dr. Schrodt, infection control and prevention always a big focus for physicians. What in this case do physicians need to know about infection prevention and control measures for monkeypox in their health care settings to protect themselves and their patients?

**Dr. Schrodt:** So there's actually a really helpful page on the CDC monkeypox website that details infection prevention and control recommendations in health care settings. But briefly, if you suspect your patient could have monkeypox, place the patient in a single person room and immediately consult your state health department. Recommended PPE for health care personnel who enter the patient's room is the same as for COVID-19.
So this includes a gown, gloves, eye protection and N95 respirator or higher. Standard cleaning and disinfection procedures should also be performed of course in accordance with the manufacturer instructions, using an EPA registered hospital grade disinfectant with an emerging viral pathogen claim.

**Unger:** Thank you. Dr. McQuiston, one question that physicians are often asked is if a patient suspects they may have monkeypox or have been exposed to monkeypox, what should they do first? Where do they start?

**Dr. McQuiston:** Physicians have a really important role in counseling patients with suspected or confirmed monkeypox so that those individuals can take steps to protect others from the start, even before a test result comes back. So patients with a new or unexplained rash or other monkeypox symptoms should see a health care provider. And if that patient has been exposed to monkeypox or thinks they might have it, they need to tell their health care provider so that the provider can take appropriate precautions when they see them.

And a provider should really instruct those individuals who come in thinking they might have monkeypox, or come in with symptoms of it that, they need to isolate at home while they’re waiting on the results of the test. They need to keep their lesions covered and avoid close contact, including sexual contact with other people. And they should also avoid coming in contact with pets, except for medical care or emergencies.

And so, I think the thing is that people who are suspected monkeypox patients are waiting on a test result, need to follow those precautions. And those are also the precautions that are recommended for people with confirmed or probable monkeypox. So, keeping yourself isolated away from other people and really stopping the spread is important.

**Unger:** Well, we’ve talked a lot about the treatment part of this. Let's talk now about prevention, which is obviously extremely important. Dr. Schrodt, what do we know about how monkeypox is spread?

**Dr. Schrodt:** Monkeypox virus is transmitted by symptomatic individuals through close contact with lesions, bodily fluids, including respiratory secretions, and objects that have had contact with lesion crusts or bodily fluids, such as contaminated linens or bandages. The virus can also be transmitted from pregnant people to their fetus through the placenta. And monkeypox can spread from the time symptoms start until the rash has fully healed over and a fresh layer of skin has formed.

**Unger:** Well, what should physicians be telling people about prevention strategies? Are there things that people can do to lessen their exposure?

**Dr. Schrodt:** Absolutely. Prevention strategies should emphasize avoiding close skin to skin contact or sexual activity with someone who has a rash that might be or is confirmed to be due to monkeypox.
Items like dishes, towels or bedding should not be shared with somebody with monkeypox and people should wash their hands often with soap and water or use an alcohol-based hand sanitizer especially after contact with sick people. And to lessen the risk of unknown exposures, when thinking about events or activities, attendees should consider how much close personal skin-to-skin contact is likely to occur at the event they plan to attend.

Events with fully clothed attendees and minimal skin-to-skin contact are lower risk. In contrast, raves, parties or clubs where there is minimal clothing have some risk. And as you might imagine enclosed spaces such as backrooms, saunas or sex clubs, where there is minimal or no clothing and where intimate sexual contact occurs, have a higher likelihood of spreading monkeypox. So people should talk to their partners about any recent illness and be aware of new or unexplained sores or rashes on their body or their partner's body, including the genitals and anus.

**Unger:** Dr. McQuiston, as a veterinarian, you specialize in outbreak investigations and research involving diseases that spread from animals to people. Why are we seeing such a large monkeypox outbreak now? Is this a growing trend among infectious diseases? And if so, what's driving it and how do we prepare for something like this?

**Dr. McQuiston:** It's a great question. And I mean, coming off of COVID, which was also a zoonotic pathogen to start with, I think it certainly raises questions in people's minds. I think we've known about and studied monkeypox for decades. But this current outbreak is turning much of what we thought we knew on its head. So historically monkeypox was thought to occur occasionally in disease endemic regions of Africa. And it was usually associated with wild animal contact followed by a limited person-to-person spread.

And we've known that Nigeria has been experiencing an outbreak of monkeypox since 2017 with occasional travelers coming from Nigeria being diagnosed with monkeypox when they returned to their home countries. In the U.S., we had two such cases last year. So it's on our radar. But we had not previously thought of monkeypox as having such a degree of sustained person-to-person spread before or thought of monkeypox as potentially a sexually transmitted or intimate contact type of infection, although we knew close contact could spread it.

But this sustained a person-to-person spread through sexual networks and nearly simultaneous emergence around the globe associated with those networks, it wasn't something that we had on our radar or had predicted. I think there is a lot of travel occurring right now, post COVID-19, and I think that many of the early cases in Europe were associated with large events and venues featuring attendance by many gay, bisexual and other men who have sex with men. And I think that that sort of travel really accelerated spread around the globe.

I think that one explanation is that monkeypox might have been circulating in this manner for some time, perhaps in the endemic countries, but it was undetected against the backdrop of other expected
cases from endemic disease. And it wasn't until it moved through the sexual networks and seeded globally that we became so aware of it. One of the things we're trying to do is study the genetic fingerprint of viruses from cases and also looking back at stored samples to see if we can form a clearer picture of how and when the current outbreak got started and how it spread.

But a lot of emerging diseases in humans are zoonotic. Monkeypox is just one example. And that means they start in animals before spreading to people and sparking larger, sometimes global epidemics, or even pandemics like SARS-CoV-2. We live in an increasingly interconnected world and humans are encroaching into areas that bring us more and more in contact with animals.

And one of the things that we really espouse here at CDC is a one health approach. It's why somebody like me who's a veterinarian might work at CDC on infectious diseases. Because the health of humans is intimately connected to the health of animals and our shared environments. And thinking about it from that perspective is critical to help us understand, respond to and then prevent future outbreaks.

**Unger:** And that's just one more echo of the COVID pandemic, isn't it?

**Dr. McQuiston:** It is, and also influenza. Pandemic influenza also can start from zoonotic influenza viruses. So we have a lot of historical examples. And I think looking to the future, we can expect more.

**Unger:** Absolutely. Dr. Schrodt, so speaking of these echoes what have we learned from the COVID pandemic that the CDC can now use to inform its approach to monkeypox and future disease outbreaks? How do we combat the stigma that's associated with this virus?

**Dr. Schrodt:** Thanks, Todd. You and Dr. McQuiston are right. We have learned so much from the COVID-19 pandemic that can now be applied. We find ourselves emphasizing the same principles for risk reduction like changing behavior, infection prevention strategies, and case identification and contact tracing. Vaccination, particularly after an exposure, is another tool but given that there is limited vaccine supply, nonpharmacologic interventions like encouraging safer sex practices are also important.

And to reduce stigma, we must be as sensitive as possible while providing people actionable information. So, providers can consider messaging that underscores that while many of those affected in the current global outbreaks identify as gay or bisexual, infectious diseases rarely stay within community or geographic boundaries. It's important to reach out to the gay and bisexual community with non-alarmist, fact-based messaging about monkeypox that provides people with tools they can use to protect themselves and others.

**Unger:** Thank you so much. Dr. McQuiston, we've covered so much ground here today. If physicians want to learn more about monkeypox, where can they find more resources on the topic?
Dr. McQuiston: CDC maintains a pretty extensive website and we've got new information coming up all the time. Physicians can refer to that website at www.cdc.gov/poxvirus.

Unger: Excellent. Again that's www.cdc.gov/poxvirus for more information and resources. Thank you, Dr. McQuiston, Dr. Schrodt. That was a lot of great information. We hope that addresses a lot of the questions that we're receiving here at the AMA. We'll also be building out more resources and pointing to the ones that you're building. Thanks again and we'll be back soon with another Moving Medicine episode and podcast. You can find all our videos and podcasts at ama-assn.org/podcast. Thanks for joining us today and please take care.

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