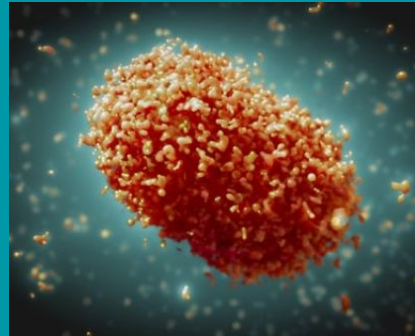


Monkeypox: What Clinicians Need to Know



Miranda Durham, MD
Infectious Disease Bureau Medical Director
July 21, 2022



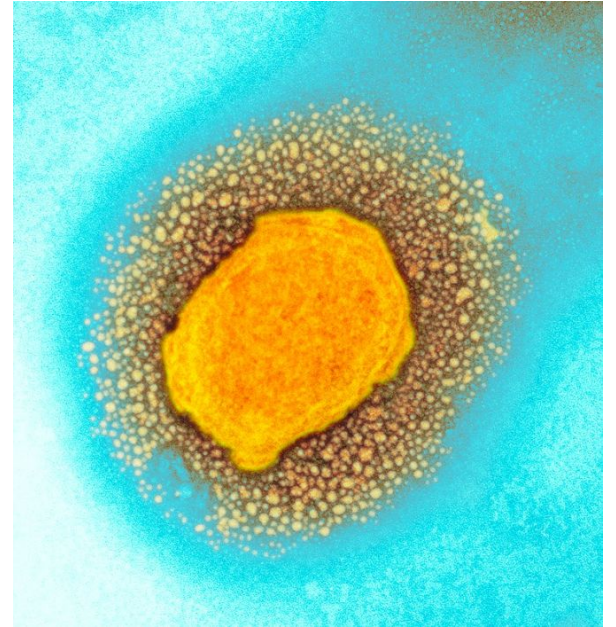
Monkeypox Virus

- Monkeypox virus is an enveloped double-stranded DNA virus that belongs to the *Orthopoxvirus* genus of the *Poxviridae* family.
- There are two distinct genetic clades of the monkeypox virus: the Central African (Congo Basin) clade and the West African clade.
- The Congo Basin clade typically causes more severe disease
- US outbreak is West African clade



Monkeypox Virus

- Monkeypox was discovered in 1958 in research monkeys in a lab in Copenhagen, Denmark
- First human case was reported in 1970 in a 9 month old in DRC
- First case reported outside of Africa was in 2003 in a 3yo in the US



Credit: UK Health Security Agency/Science Photo Library

2003 US Outbreak

47 human cases; 6 states

People became ill after contact with pet prairie dogs infected after exposure to small mammals imported from West Africa

No cases attributed exclusively to person-to-person contact

First reported human monkeypox cases outside of Africa

CDC's restriction on the importation of African rodents remains in place



Natural host of monkeypox virus

Various animal species have been identified as susceptible to monkeypox virus including:

- Rope squirrels
- Tree squirrels
- Gambian pouched rats
- Dormice
- Non-human primates
- Anteaters
- Hedgehogs
- Prairie dogs
- Shrews
- other species

Further studies are needed to identify the exact animal reservoir(s) and how virus circulation is maintained in nature.

Confirmed Cases

15,378
Total

15,135
In countries that have not historically reported monkeypox

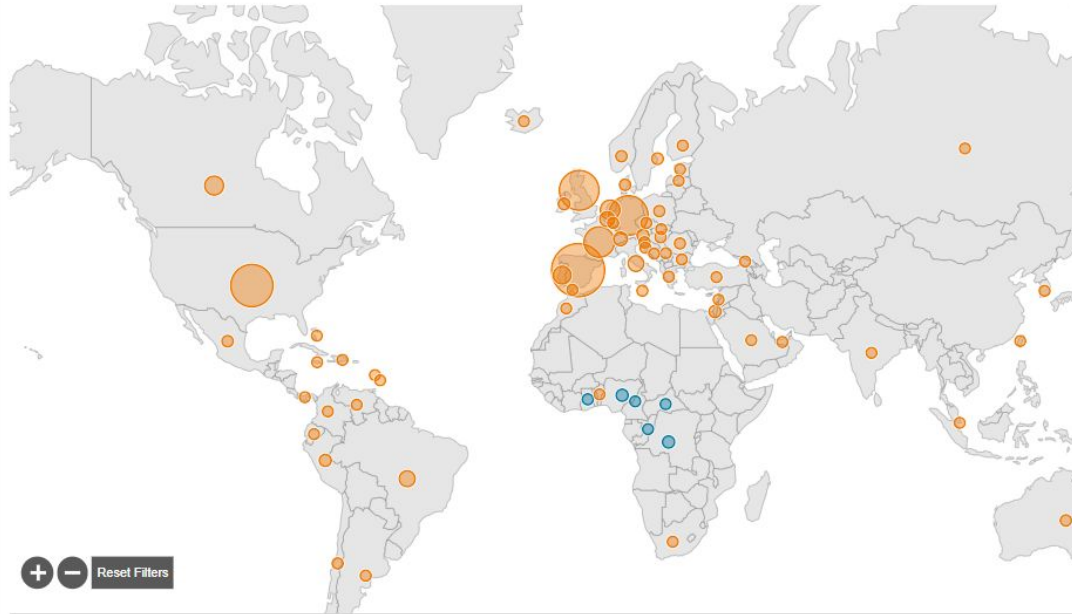
243
In countries that have historically reported monkeypox

Locations

71
Total

65
In countries that have not historically reported monkeypox

6
In countries that have historically reported monkeypox

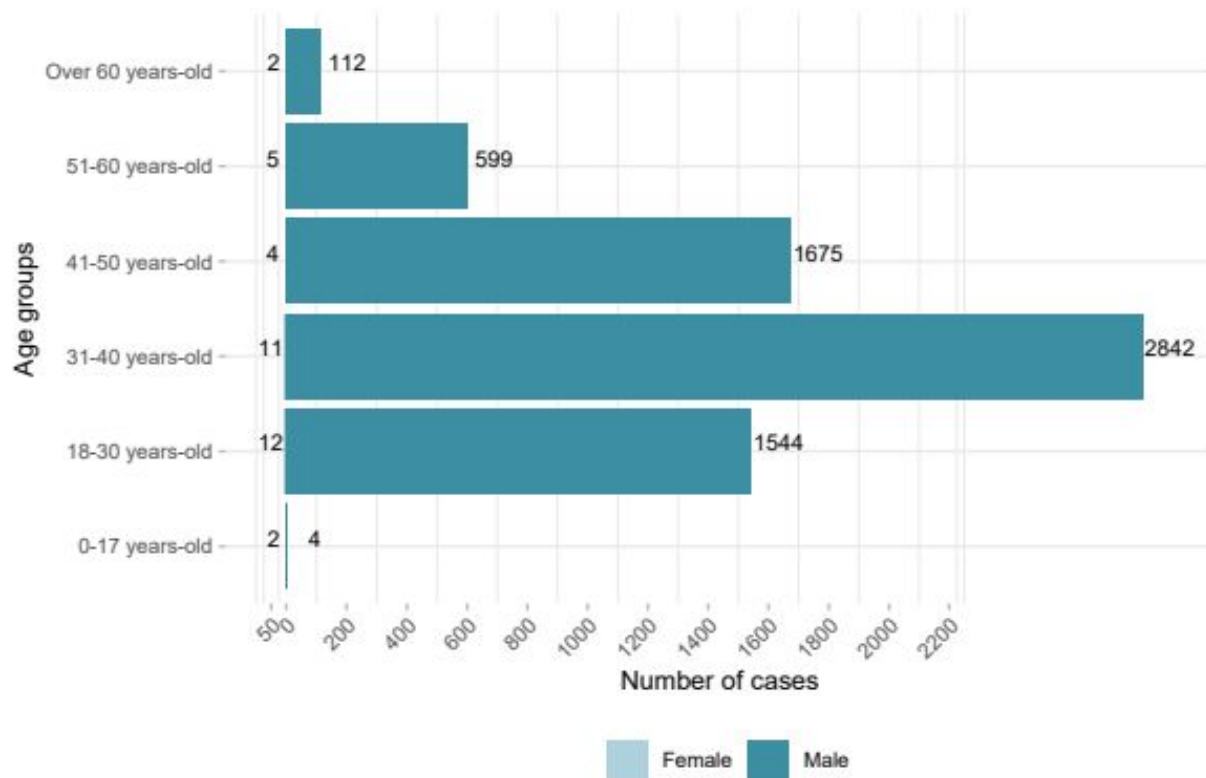


Legend

● Has not historically reported monkeypox

● Has historically reported monkeypox

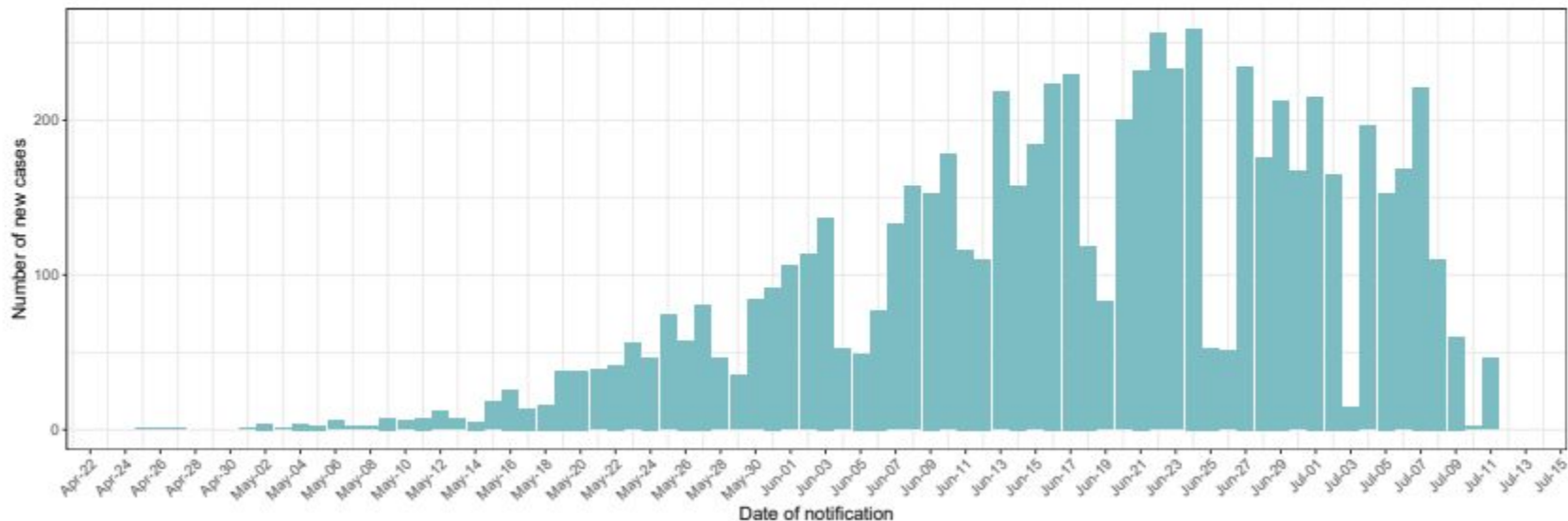
Figure 6: Age and gender distribution of cases of monkeypox, European Region, TESSy, 2022



<https://www.who.int/europe/publications/m/item/joint-ecdc-who-regional-office-for-europe-monkeypox-surveillance-bulletin--13-july-2022>

Overall by date of notification

Figure 1: Overall number of cases of monkeypox, per date of notification, European Region, TESSy, 2022



<https://www.who.int/europe/publications/m/item/joint-ecdc-who-regional-office-for-europe-monkeypox-surveillance-bulletin--13-july-2022>

Monkeypox Transmission

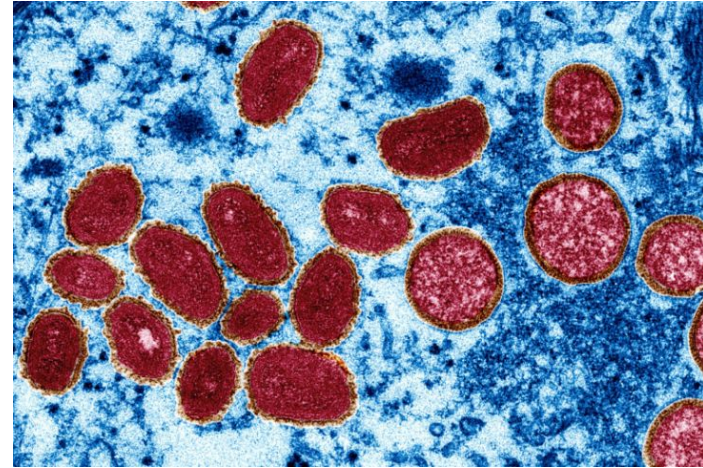
The virus can spread from person-to-person through:

- direct contact with the infectious rash, scabs, or body fluids
- respiratory secretions during prolonged, face-to-face contact, or during intimate physical contact, such as kissing, cuddling, or sex
- touching items (such as clothing or linens) that previously touched the infectious rash or body fluids
- pregnant people can spread the virus to their fetus through the placenta

It's also possible for people to get monkeypox from infected animals, either by being scratched or bitten by the animal or by preparing or eating meat or using products from an infected animal.

Disease Progression

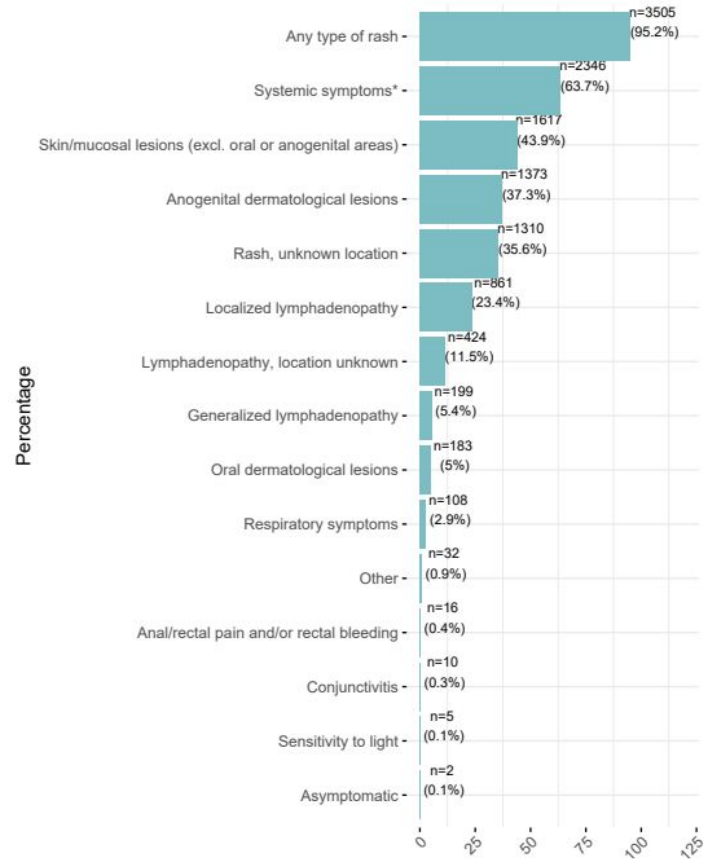
- Incubation is up to 21 days but usually 5 - 12 days
- Monkeypox can spread from the time symptoms start until the rash has fully healed and a fresh layer of skin has formed.
- The illness typically lasts 2-4 weeks.
- People who do not have monkeypox symptoms cannot spread the virus to others.



Symptoms

The average time between symptom onset and diagnosis was 7 days.

Figure 7: Distribution of symptoms among those reporting at least one type of symptom (N=3683), European Region, TESSy, 2022



SYMPTOMS

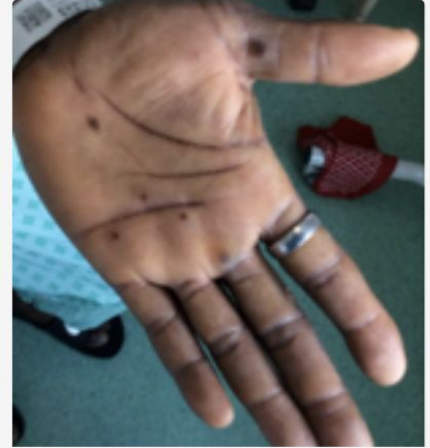
Symptoms of monkeypox can include:

- Fever
- Headache
- Muscle aches and backache
- Swollen lymph nodes
- Chills
- Exhaustion
- A rash that can look like pimples or blisters that appears on the face, inside the mouth, and on other parts of the body, like the hands, feet, chest, genitals, or anus.



The rash goes through different stages before healing completely. Sometimes, people get a rash first, followed by other symptoms. Others only experience a rash.

Visual Examples of Monkeypox Rash





Monkeypox Lesions

Not Monkeypox



Clinical Features of May 2022 Outbreak

- Rash or enanthem in all patients
- Lesions in different phases of development seen side-by-side
- Rash either scattered or diffuse; sometimes limited to one body site and mucosal area (e.g., anogenital region or lips/face)
- Presenting complaint sometimes anorectal pain or tenesmus; physical examination yields visible lesions and proctitis
- Prodromal symptoms mild or not occurring
- Fever, lymphadenopathy not occurring in all patients
- Some co-infections with sexually transmitted infections

CDC Guidance to Clinicians - When to Test

HISTORY is Key!


- Observation of classic monkeypox rash
- Observation of rash that could be consistent with monkeypox in people with epidemiologic risk factors:
 - Contact with a person with similar appearing rash diagnosed with monkeypox
 - Close or intimate in-person contact with people in a social network experiencing monkeypox activity (e.g., men who have sex with men who meet partners through an online website, digital app or social event)
 - History of recent international travel to country currently reporting cases:
<https://wwwnc.cdc.gov/travel/notices/>
- When lesions are not consistent with classic lesions, full body skin exam should be done to evaluate whether some classic lesions are observed
- Diagnosis of STI does not rule-out co-infection with monkeypox
- Call NMDOH: 505-827-0006

Testing

1. Call NMDOH ERD 505-827-0006
2. Use personal protective equipment (PPE) for standard, contact, and droplet precautions. (N95 mask, eye protection, gown, gloves)
3. If the patient has multiple lesions, swab up to 4 lesions, preferably from different locations on the body and/or from lesions with differing appearances.
4. Vigorously swab each lesion **with two** separate sterile dry polyester or Dacron swabs (one sample for preliminary and one for confirmatory testing at CDC). Do not use cotton swabs.
5. Place each swab in a separate “sterile” container such as a urine cup or pour-off tube (plastic preferred).
6. **Do not add or store in viral or universal transport media.**
7. Each lesion site that is sampled requires a separate test requisition form. Put both samples from one site in the biohazard bag with one requisition.
<https://www.nmhealth.org/publication/view/form/6380/>
8. Immediately refrigerate samples (2-8°C)
9. NMDOH will provide shipping instructions.



Commercial Labs that do Monkeypox testing



Quest Diagnostics

Patients Healthcare professionals Laboratory managers Business

Test Directory About our tests Access patient results Billing & coding Lab tools & IT systems

Quest Corporate / Healthcare professionals / About our tests / Infectious diseases / Monkeypox

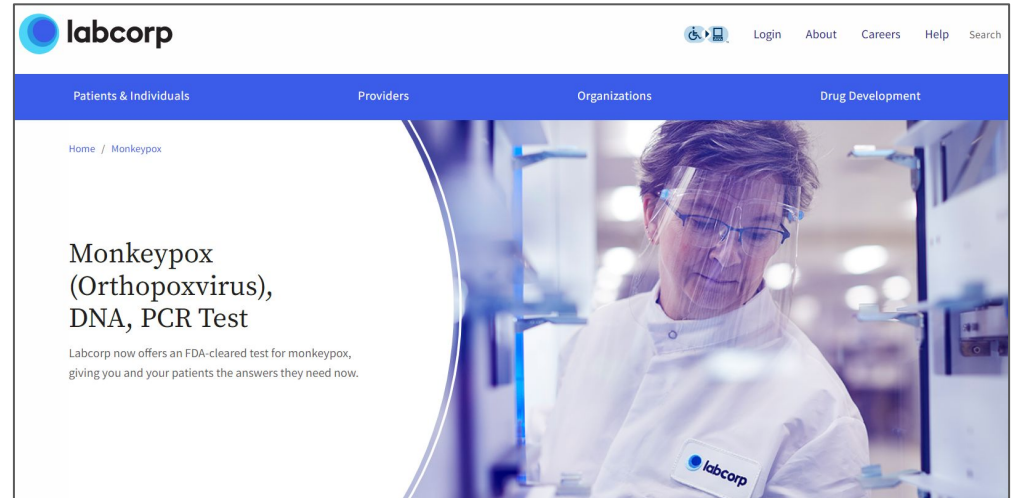
Monkeypox

Quest now offers a test to detect monkeypox virus DNA, delivering faster answers for you and your patients.



Last updated July 13, 2022

<https://www.questdiagnostics.com/healthcare-professionals/about-our-tests/infectious-diseases/monkeypox>



labcorp


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Monkeypox (Orthopoxvirus), DNA, PCR Test

Labcorp now offers an FDA-cleared test for monkeypox, giving you and your patients the answers they need now.



<https://www.labcorp.com/infectious-disease/monkeypox>

TREATMENT of Monkeypox

- Tecovirimat (also known as TPOXX, ST-246)
- Requested from CDC/SNS
- Indications: Patients with monkeypox with immune compromise, lesions in mouth/genitals or around the eyes
- Clinical trials in people showed the drug was safe and had only minor side effects.
- FDA approved for smallpox, but not monkeypox
- CDC holds an expanded access protocol (sometimes called “compassionate use”) that allows for the use of stockpiled tecovirimat to treat monkeypox during an outbreak.
- Tecovirimat is available as a pill or an injection.
- For children who weigh less than 28.6 pounds, the capsule can be opened, and medicine mixed with semi-solid food



Other treatments for Monkeypox

- **Vaccinia Immune Globulin Intravenous (VIGIV)**

VIGIV is [licensed by FDA \[PDF – 18 pages\]](#)

VIG can be considered for prophylactic use in an exposed person with severe immunodeficiency in T-cell function for which smallpox vaccination following exposure to monkeypox virus is contraindicated.

- **Cidofovir (also known as Vistide)**

Cidofovir is an antiviral medication that is [approved by the FDA \[PDF – 6 pages\]](#)

for the treatment of cytomegalovirus (CMV) retinitis in patients with Acquired Immunodeficiency Syndrome (AIDS). Data is not available on the effectiveness of Cidofovir in treating human cases of monkeypox.

- **Brincidofovir (also known as CMX001 or Tembexa)**

Brincidofovir is an antiviral medication that was [approved by the FDA \[PDF – 21 pages\]](#)

on June 4, 2021 for the treatment of human smallpox disease in adult and pediatric patients, including neonates. Data is not available on the effectiveness of Brincidofovir in treating cases of monkeypox in people. Not currently available.

CDC VACCINE STRATEGY

1. Monkeypox Vaccine Post-Exposure Prophylaxis (PEP):

- “Standard PEP” for monkeypox.
- People can be vaccinated following exposure to monkeypox to help prevent illness from monkeypox virus.

2. Outbreak Response Monkeypox Vaccine Post-Exposure Prophylaxis (PEP)++:

- expanded PEP” or “PEP plus-plus” or “PEP++”.
- Vaccinate people who are more likely to have been recently exposed to monkeypox even if they have not had documented exposure to someone with confirmed monkeypox

3. Monkeypox Vaccine Pre-Exposure Prophylaxis (PrEP):

- vaccinate people at high risk for monkeypox (for example, laboratory workers who handle specimens that might contain monkeypox virus).
- Most providers do not need vaccination

<https://www.cdc.gov/poxvirus/monkeypox/clinicians/smallpox-vaccine.html>

CDC VACCINE STRATEGY

Post Exposure Prophylaxis

- CDC recommends that the vaccine be given within 4 days from the date of exposure for the best chance to prevent onset of the disease.
- If given between 4 and 14 days after the date of exposure, vaccination may reduce the symptoms of disease, but may not prevent the disease.
- New Mexico has vaccine on hand for PEP

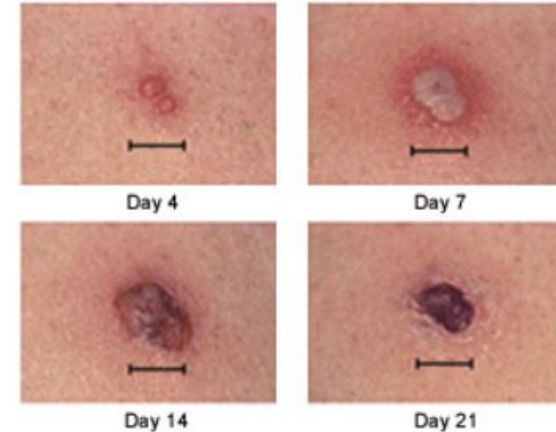
JYNNEOS VACCINE for Monkeypox

- JYNNEOS is a live, attenuated, non-replicating virus vaccine
- FDA approved in 2019 for prevention of smallpox and monkeypox disease in adults 18+
- Two doses given four weeks apart.
- Administered subcutaneously
- Single dose vial (0.5mL)
- Most common side effects: injection site reactions (pain, redness, swelling, induration, itching), muscle pain, headache, fatigue, nausea, myalgia, chills



ACAM2000

- FDA approved for prevention of smallpox disease in high risk people
- Replication-competent vaccinia virus
- Complications from the vaccinia virus can be severe in immune compromised people
- Can be transmitted from the vaccine recipient to unvaccinated persons who have close contact with the inoculation site
- ACAM2000® is administered as a single dose by the percutaneous route using the multiple puncture technique.
- The **2015 ACIP recommendations** advise routine vaccination of laboratory personnel who directly work with orthopox viruses.



Evaluating Exposures

- In general:

Transmission of monkeypox requires prolonged close contact with a symptomatic individual. Brief interactions and those conducted using appropriate PPE in accordance with Standard Precautions are not high risk and generally do not warrant PEP

- Call NMDOH: 505-827-0006 (epidemiology on call)

Monitoring Exposed Healthcare Professionals

Any healthcare worker who has cared for a monkeypox patient should be alert to the development of symptoms that could suggest monkeypox infection, especially within the 21 day period after the last date of care, and should notify infection control, occupational health, and the health department to be guided about a medical evaluation.

Healthcare workers who have unprotected exposures (i.e., not wearing PPE) to patients with monkeypox do not need to be excluded from work duty, but should undergo active surveillance for symptoms, which includes measurement of temperature at least twice daily for 21 days following the exposure. Prior to reporting for work each day, the healthcare worker should be interviewed regarding evidence of fever or rash.

Healthcare workers who have cared for or otherwise been in direct or indirect contact with monkeypox patients while adhering to recommended infection control precautions may undergo self-monitoring or active monitoring as determined by the health department.

<https://www.cdc.gov/poxvirus/monkeypox/clinicians/monitoring.html>

Degree of Exposure: High

Recommendations

- Monitoring⁵
 - PEP[¶] – Recommended
-

Exposure Characteristics

- Unprotected contact between a person's skin or mucous membranes and the skin, lesions, or bodily fluids from a patient (e.g., any sexual contact, inadvertent splashes of patient saliva to the eyes or oral cavity of a person, ungloved contact with patient), or contaminated materials (e.g., linens, clothing) -OR-
- Being inside the patient's room or within 6 feet of a patient during any procedures that may create aerosols from oral secretions, skin lesions, or resuspension of dried exudates (e.g., shaking of soiled linens), without wearing an N95 or equivalent respirator (or higher) and eye protection -OR-
- Exposure that, at the discretion of public health authorities, was recategorized to this risk level (i.e., exposure that ordinarily would be considered a lower risk exposure, raised to this risk level because of unique circumstances)

Degree of Exposure: Intermediate

Recommendations

- Monitoring^s
 - PEP[¶] – Informed clinical decision making recommended on an individual basis to determine whether benefits of PEP outweigh risks ^{¶¶}
-

Exposure Characteristics

- Being within 6 feet for 3 hours or more of an unmasked patient without wearing, at a minimum, a surgical mask -OR-
- Activities resulting in contact between sleeves and other parts of an individual's clothing and the patient's skin lesions or bodily fluids, or their soiled linens or dressings (e.g., turning, bathing, or assisting with transfer) while wearing gloves but not wearing a gown -OR-
- Exposure that, at the discretion of public health authorities, was recategorized to this risk level because of unique circumstances (e.g., if the potential for an aerosol exposure is uncertain, public health authorities may choose to decrease risk level from high to intermediate)

Degree of Exposure: Low/Uncertain

Recommendations

- Monitoring⁵
 - PEP⁶ – None
-

Exposure Characteristics

- Entered the patient room without wearing eye protection on one or more occasions, regardless of duration of exposure -OR-
- During all entries in the patient care area or room (except for during any procedures listed above in the high-risk category), wore gown, gloves, eye protection, and at minimum, a surgical mask -OR-
- Being within 6 feet of an unmasked patient for less than 3 hours without wearing at minimum, a surgical mask -OR-
- Exposure that, at the discretion of public health authorities, was recategorized to this risk level based on unique circumstances (e.g., uncertainty about whether Monkeypox virus was present on a surface and/or whether a person touched that surface)

Degree of Exposure: No Risk

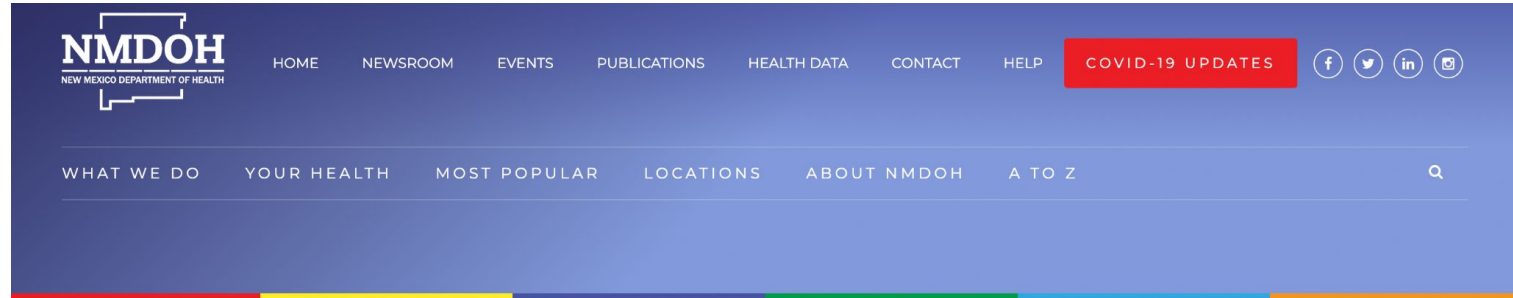
Recommendations

- Monitoring⁵ – None
 - PEP⁶ – None
-

Exposure Characteristics

- Exposure that public health authorities deemed did not meet criteria for other risk categories

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Monkeypox Virus

Overview

Monkeypox is a rare disease caused by infection with the monkeypox virus. It was first discovered in 1958 when there were two outbreaks of a pox-like disease in colonies of monkeys kept for research. The first human case was in 1970. Prior to 2022, nearly all U.S. cases were related to international travel.

[Monkeypox: Get The Facts Poster \(English\)](#)

[Monkeypox: Get The Facts Poster \(Spanish\)](#)



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MONKEYPOX: Get the FACTS

- Monkeypox is a rare disease caused by the monkeypox virus.
- Monkeypox can make you sick including a rash or sores (pox), often with an earlier flu-like illness.
- Monkeypox can spread to anyone through close, personal, often skin-to-skin contact including:
 - Direct contact with monkeypox rash, sores or scabs
 - Contact with objects, fabrics (clothing, bedding, or towels), and surfaces that have been used by someone with monkeypox
 - Through respiratory droplets or oral fluids from a person with monkeypox
- This contact can happen during intimate sexual contact including:
 - Oral, anal, and vaginal sex or touching the genitals or anus of a person with monkeypox
 - Hugging, massage, or kissing and talking closely
 - Touching fabrics and objects during sex that were used by a person with monkeypox, such as bedding, towels and sex toys
- We know the virus can be spread in fluid or pus from monkeypox sores, and are trying to better understand if virus could be present in semen, vaginal fluids or other body fluids.

WHAT ARE THE SYMPTOMS?

- Early flu-like symptoms of monkeypox can include:



- A rash or sores, sometimes located on or near the genitals or anus, but sometimes in other areas like the hands, feet, chest or face – sores will go through several stages before healing.

Sores may be inside the body, including the mouth, vagina, or anus.



Some people experience a rash or sores first, followed by other symptoms and some only experience a rash or sores.

- Monkeypox can be spread from the time symptoms start until all sores have healed and a fresh layer of skin has formed – this can take several weeks.

IF YOU HAVE A NEW OR UNEXPLAINED RASH, SORES, OR OTHER SYMPTOMS...

- See your healthcare provider – if you don't have a provider or health insurance, visit a public health clinic near you.
- When you see a healthcare provider for possible monkeypox, remind them that this virus is circulating in the community.
- Avoid sex or being intimate with anyone until you have been checked out.

IF YOU OR YOUR PARTNER HAVE MONKEYPOX...

- Follow the treatment and prevention recommendations of your healthcare provider.
- Avoid sex or being intimate with anyone until all your sores have healed and you have a fresh layer of skin formed.

For more information, please visit <https://www.nmhealth.org/about/phd/idb/mpv/>

July 2022



May 2022

Monkeypox: Get the Facts

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 - Through respiratory droplets or oral fluids from a person with monkeypox
- This contact can happen during intimate sexual contact including:
 - Oral, anal, and vaginal sex
 - Hugging, massage, or mutual masturbation
 - Kissing and talking closely
 - Touching fabrics and objects during sex that were used by a person with monkeypox, such as bedding, towels and sex toys
- We know the virus can be spread in fluid or pus from monkeypox sores, and are trying to better understand if virus could be present in semen or vaginal fluids



What Are the Symptoms?

- Early flu-like symptoms of monkeypox can include:

- Fever
- Headache
- Muscle aches and backache
- Swollen lymph nodes
- Chills
- Exhaustion



- A rash or sores, sometimes located on or near the genitals or anus, but sometimes in other areas like the hands, feet, chest or face – sores will go through several stages before healing
- Sores may be inside the body, including the mouth, vagina, or anus
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- When you see a healthcare provider for possible monkeypox, remind them that this virus is circulating in the community
- Avoid sex or being intimate with anyone until you have been checked out



If You or Your Partner Have Monkeypox...

- Follow the treatment and prevention recommendations of your healthcare provider
- Avoid sex or being intimate with anyone until all your sores have healed and you have a fresh layer of skin formed.



For more information, please visit www.cdc.gov/monkeypox

NMDOH Monkeypox site:
<https://www.nmhealth.org/about/phd/idb/mpv/>

CDC Monkeypox site:
<https://www.cdc.gov/poxvirus/monkeypox/pdf/Monkey-Pox-sexually-active-InfoSheet-508.pdf>

Summary

- While monkeypox cases continue to increase, risk to the general public is low with transmission primarily occurring among specific social networks
- Clinicians should be alert to potential monkeypox infections and call Epidemiology and Response Division 24/7 at (505)827-0006
- Testing for Monkeypox is available through the state public health lab (SLD) Quest Diagnostics, Labcorp, Aegis Sciences, Mayo Clinic Labs
- This is an evolving situation so new information continues to emerge
- NM expects to receive more doses of JYNNEOS in coming month.

Summary

NM Health Alert Network (HAN)

The NM Health Alert Network (HAN) is the NMDOH's communications platform that allows for rapid dissemination of important public health information to our key healthcare partners and emergency response personnel, on a 24/7/365 basis.

To receive health alerts directly to your email, sign up for the Health Alert Network (HAN)

<https://nm.readyop.com/fs/4cjZ/10b2>

Additional resources

- MAY 26, 2022 NMDOH HAN here
<https://www.nmhealth.org/publication/view/general/7527/>
- JULY 8, 2022 HAN here
<https://www.nmhealth.org/publication/view/general/7614/>
- There is also a page on the NMDOH website with monkeypox resources information for clinicians and the general public
[nmhealth.org/Monkeypox](https://www.nmhealth.org/Monkeypox)
- [cdc.gov/poxvirus/monkeypox](https://www.cdc.gov/poxvirus/monkeypox)

DOH Contact Information for Providers

CONTACT INFO	DESCRIPTION
Epidemiology and Response Division 505-827- 0006	Epidemiologist on call for guidance on any reportable diseases (monkeypox, measles, rabies, etc)
COVID.Vaccines@state.nm.us	COVID-19 Vaccine Record requests; Provider COVID-19 Vaccine Order status; NMSIIS assistance.
COVID.Therapeutics@state.nm.us	Provider questions regarding COVID therapeutics
COVIDData.compliant@state.nm.us	COVID-19 vaccine storage and handling questions, temperature log and onboarding Vaccine Plan submissions.
COVID.testing-doh@state.nm.us	For Provider questions on testing and test supplies

DOH Contact Information for Patients

CONTACT INFO	DESCRIPTION
COVID-19 Hotline: 1-855-600-3453	Users who have questions or would like support with COVID vaccine registration and testing Taking Monkeypox questions
ALTSD assistance: 1-800-432-2080	For seniors and those with disabilities who need support with vaccine registration and scheduling.
1-833-551-0518	For non-health related COVID-19 questions



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YOU for all
that
you do!**

Mexico City