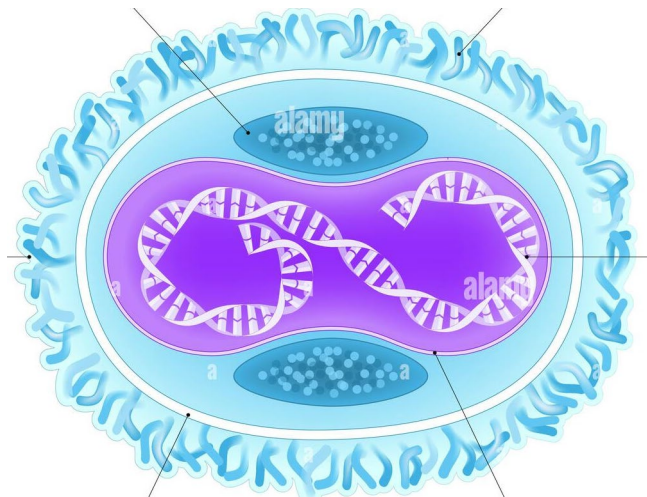


Tracking Monkeypox (MPV) in Nebraska

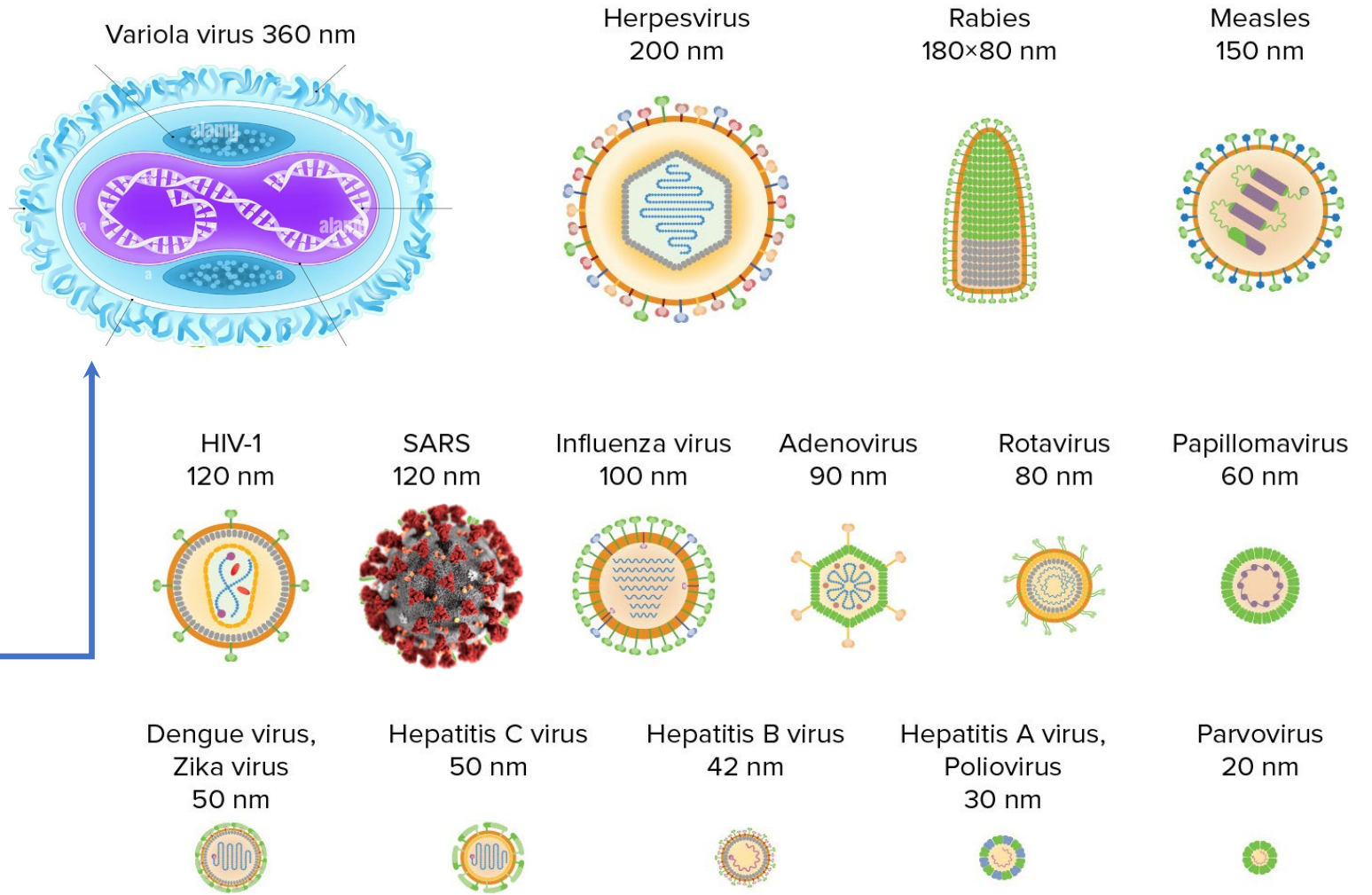
September 1, 2022



Monkeypox - Presentation

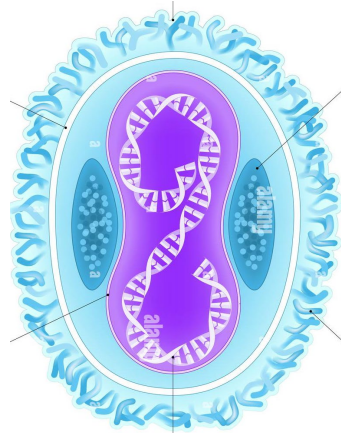


RNA	cubic	no	Reoviridae
			Caliciviridae
			Picornaviridae
	spiral	yes	Flaviviridae (Arbovirus ⁽¹⁾)
			Togaviridae
			Coronaviridae
			Rhabdoviridae
	complex	yes	Paramyxoviridae
			Orthomyxoviridae
			Arenaviridae
DNA	cubic	no	Retroviridae
			Papillomaviridae
			Parvoviridae
		yes	Adenoviridae
			Iridoviridae
	indeterminate	yes	Herpesviridae
		yes	Hepadnaviridae
	complex	yes	Poxviridae



Monkeypox - Presentation

RNA	cubic	no	Reoviridae
			Caliciviridae
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	spiral	yes	Flaviviridae (Arbovirus ⁽¹⁾)
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Retroviridae			
Papilloviridae			
cubic		yes	Parvoviridae
			Adenoviridae
			Iridoviridae
indeterminate		yes	Herpesviridae
			Hepadnaviridae
			Poxviridae
complex		yes	



Poxvirus Diseases

Open All

Close All

Genus *Orthopoxvirus*

Genus *Parapoxvirus*

Genus *Molluscipoxvirus*

Genus *Yatapoxviruses*

Genus *Capripoxviruses*

Genus *Suipoxviruses*

Genus *Leporipoxviruses*

Genus *Avipoxviruses*

Orthopoxviruses

- Camelpox virus
- Cowpox virus
- Ectromelia virus
- Horsepox virus
- Monkeypox virus
- Raccoonpox virus
- Skunkpox virus
- Taterapox virus
- Uasin Gishu virus
- Vaccinia virus (smallpox vaccine)
- Variola (smallpox) virus
- Volepox virus

1. Arbovirus = "Arthropod borne virus" (transmitted by biting insects)

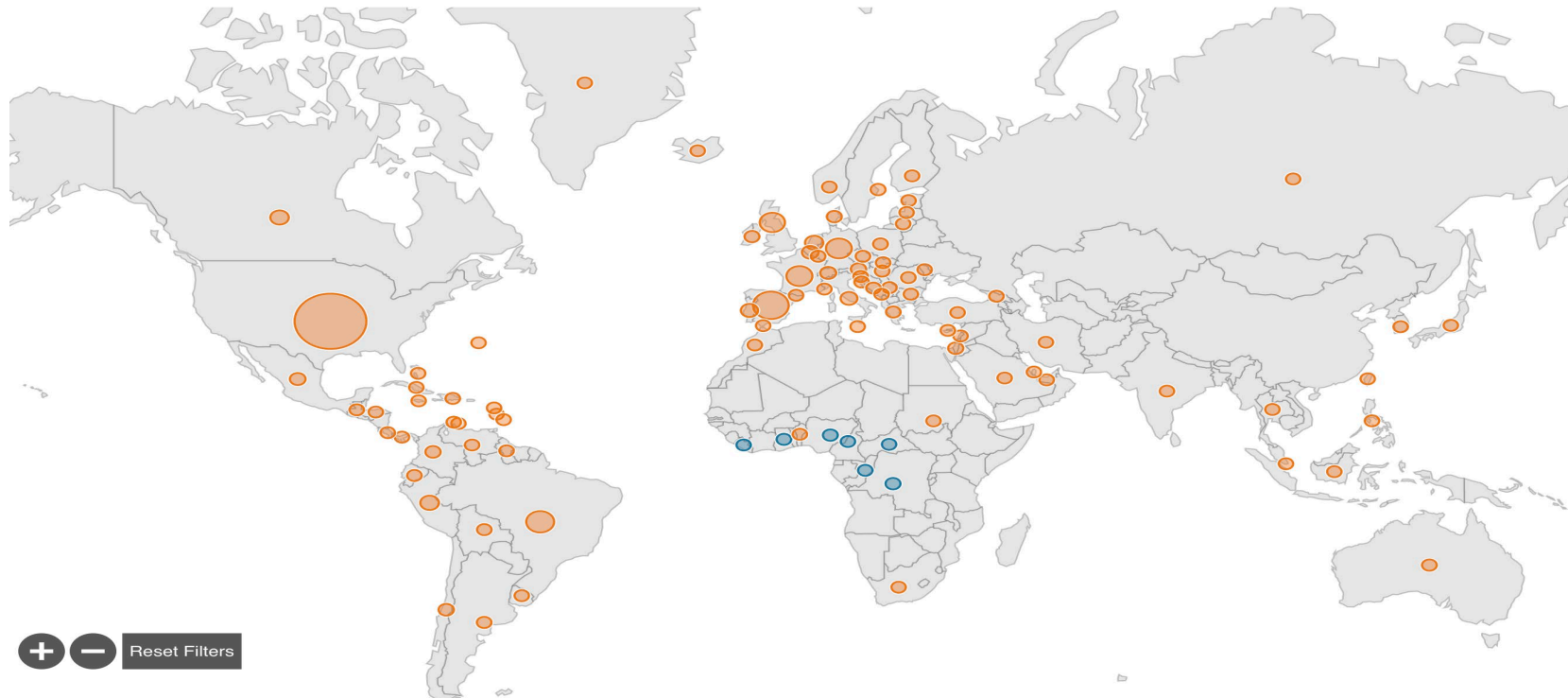
Monkeypox - Presentation

Orthopoxviruses

- Camelpox virus
- Cowpox virus
- Ectromelia virus
- Horsepox virus
- [Monkeypox virus](#)
- Raccoonpox virus
- Skunkpox virus
- Taterapox virus
- Uasin Gishu virus
- Vaccinia virus (smallpox vaccine)
- [Variola \(smallpox\) virus](#)
- Volepox virus



Monkeypox - Presentation



Location	Cases
United States Of America	18,416
Spain	6,543
Brazil	4,493
France	3,547
Germany	3,455
United Kingdom	3,279
Peru	1,463
Canada	1,228

Confirmed Cases

49,974
Total Cases

49,531
in locations that have not historically reported monkeypox

443
in locations that have historically reported monkeypox

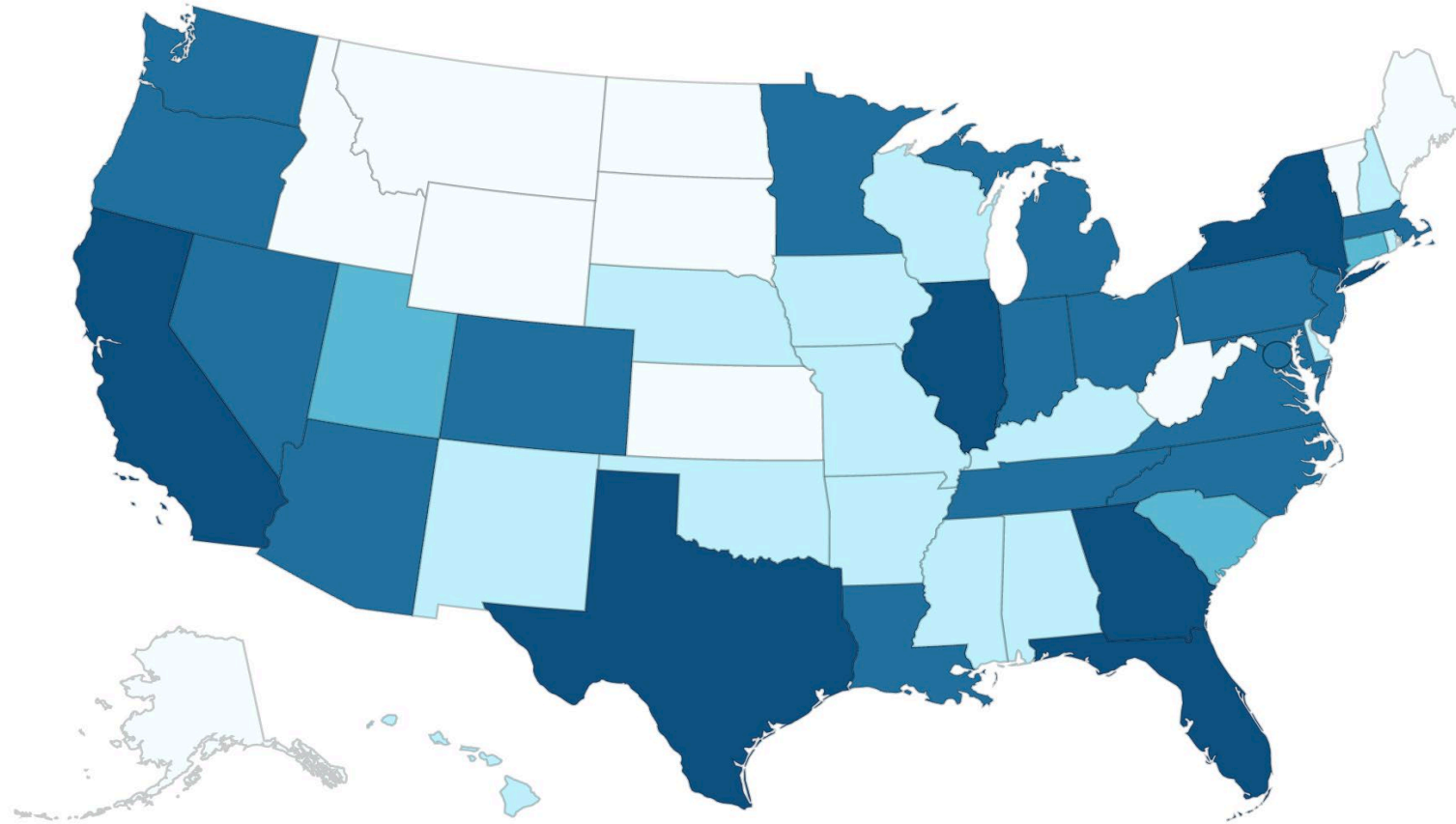
Locations with cases

99
Total

92
Has not historically reported monkeypox

7
Has historically reported monkeypox

Monkeypox - Presentation



Territories PR



Location	Cases
New York	3,291
California	3,273
Florida	1,870
Texas	1,642
Georgia	1,387
Illinois	1,058
Pennsylvania	531
New Jersey	512
Maryland	484
District Of Columbia	432
Washington	332
Massachusetts	325
Virginia	314
Arizona	308
North Carolina	303

People more likely to get monkeypox include:

- People who have been identified by public health officials as a contact of someone with monkeypox
- People who are aware that one of their sexual partners in the past 2 weeks has been diagnosed with monkeypox
- People who had multiple sexual partners in the past 2 weeks in an area with known monkeypox
- People [whose jobs may expose them to orthopoxviruses](#), such as:
 - Laboratory workers who perform testing for orthopoxviruses
 - Laboratory workers who handle cultures or animals with orthopoxviruses
 - Some designated healthcare or public health workers

Close or Intimate Contact

Monkeypox can spread to anyone through close, personal, often skin-to-skin contact, including:

- Direct contact with monkeypox rash, scabs, or body fluids from a person with monkeypox.
- Touching objects, fabrics (clothing, bedding, or towels), and surfaces that have been used by someone with monkeypox.
- Contact with respiratory secretions.

Monkeypox and Pregnancy

A pregnant person can spread the virus to their fetus through the placenta.

Infected Animals

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.

Scientists are Still Researching

- If the virus can be spread when someone has no [symptoms](#)
- How often monkeypox is spread through respiratory secretions, or when a person with monkeypox symptoms might be more likely to spread the virus through respiratory secretions.

A person with monkeypox can spread it to others 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

Monkeypox symptoms

People with monkeypox get a rash that may be located on or near the genitals (penis, testicles, labia, and vagina) (butthole) and could be on other areas like the hands, feet, chest, face, or mouth.

- The rash will go through several stages, including scabs, before healing.
- The rash can initially look like pimples or blisters and may be painful or itchy.

Other symptoms of monkeypox can include:

- Fever
- Chills
- Swollen lymph nodes
- Exhaustion
- Muscle aches and backache
- Headache
- Respiratory symptoms (e.g. sore throat, nasal congestion, or cough)

You may experience all or only a few symptoms

- Sometimes, people have flu-like symptoms before the rash.
- Some people get a rash first, followed by other symptoms.
- Others only experience a rash.

Vaccine protection



The preferred vaccine to protect against monkeypox is JYNNEOS, which is a two-dose vaccine. It takes 14 days after getting the second dose of JYNNEOS for its immune protection to reach its maximum.

The ACAM2000 vaccine may be an alternative to JYNNEOS. ACAM2000 is a single-dose vaccine, and it takes four weeks after vaccination for its immune protection to reach its maximum. However, it has the potential for more side effects and adverse events than JYNNEOS. It is not recommended for people with severely weakened immune systems and several other conditions.

HHS Expands Availability of Monkeypox Vaccine to More Than 1.1 Million Doses

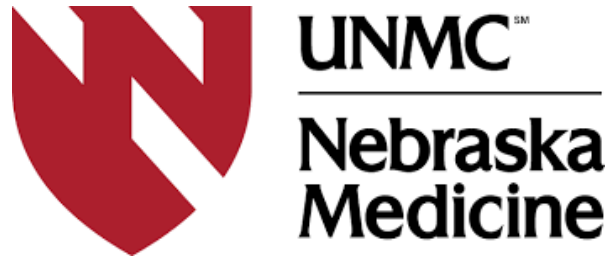
The U.S. Department of Health and Human Services (HHS) today announced plans to [allocate](#) an additional 786,000 doses of JYNNEOS vaccine, dramatically increasing the supply of monkeypox vaccine doses to states and jurisdictions. The additional vaccine allocation adds to the more than 340,000 doses of JYNNEOS vaccine that have already been delivered to jurisdictions. JYNNEOS vaccine is manufactured by Bavarian Nordic and approved by the Food and Drug Administration to prevent smallpox and monkeypox.

Cleaning & Disinfection

- [Clean and disinfect](#) the areas where people with monkeypox spent time—Avoid activities that could spread dried material from lesions (e.g., use of fans, dry dusting, sweeping, or vacuuming) in these areas. Perform disinfection using an EPA-registered disinfectant with an [Emerging Viral Pathogens](#)  claim, which may be found on EPA's [List Q](#)  . Follow the manufacturer's directions for concentration, contact time, and care and handling. Linens can be laundered using regular detergent and warm water. Soiled laundry should be gently and promptly contained in a laundry bag and never be shaken or handled in a manner that may disperse infectious material. Covering mattresses in isolation areas (e.g. with sheets, blankets, or a plastic cover) can facilitate easier laundering.

Personal Protection

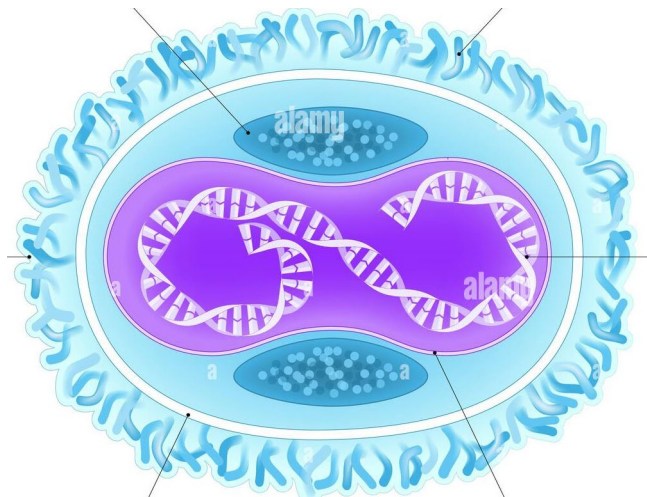
- **Provide appropriate personal protective equipment (PPE) for staff, volunteers, and residents**—Employers are responsible for ensuring that workers are protected from exposure to *Monkeypox virus* and that workers are not exposed to harmful levels of chemicals used for cleaning and disinfection. PPE should be worn by staff, volunteers, or residents in these circumstances:
 - **Entering isolation areas**—Staff who enter isolation areas should wear a gown, gloves, eye protection, and a NIOSH-approved particulate respirator equipped with N95 filters or higher.
 - **Laundry**—When handling dirty laundry from people with known or suspected monkeypox infection, staff, volunteers, or residents should wear a gown, gloves, eye protection, and a well-fitting mask or respirator. PPE is not necessary after the wash cycle is completed.
 - **Cleaning and disinfection**—Staff, volunteers, or residents should wear a gown, gloves, eye protection, and a well-fitting mask or respirator when cleaning areas where people with monkeypox spent time.



Tracking Monkeypox (MPV) in Nebraska

Mark Rupp, M.D.

September 1, 2022



Timeline

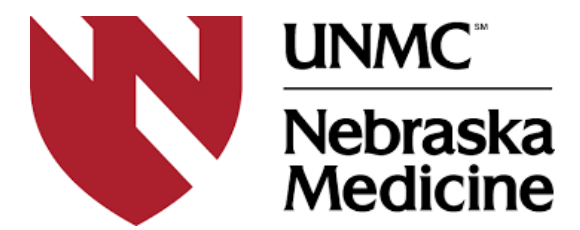
- Worldwide outbreak noted late Spring 2022
- 1st case in United States: May 18, 2022
- 1st case in Nebraska: June 27, 2022 (total cases 26 (8/29/22))
- White House monkeypox vaccine plan (June 28, 2022)
- WHO: Public Health Emergency of International Concern (July 23, 2022)
- US declares Public health Emergency (August 4, 2022)
- Tecovirimat (TPOXX) FDA approval under “Animal Rule” for smallpox in 2018; expanded to monkeypox May 19, 2022. CDC guidance under Expanded Access Investigational New Drug Protocol: August 3, 2022.
- JYNNEOS vaccine approved 2019; Intradermal dose approved: Aug 9, 2022

UNMC/Nebraska Medicine Response

- Dissemination of information to public and providers
 - NETEC
 - UNMC/NM
 - NE ICAP
- Testing
- Treatment
- Prevention/Vaccination

- Next steps and future look

Monkeypox - Presentation



National Emerging Special Pathogen Training and Education Center (NETEC): UNMC/Emory/Bellevue



News & Blog Webinars on YouTube Podcast
Education & Training Consulting Services Readiness Assessments Support for Researchers About NETEC

TRENDING **Monkeypox Outbreak**

National Emerging Special Pathogens Training and Education Center

Working together to increase the capability of the U.S. public health and health care systems to safely and effectively manage special pathogens.

<https://repository.netecweb.org/exhibits/show/monkeypox/monkeypox>



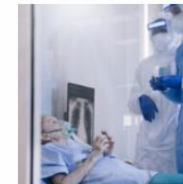
[Monkeypox Specimen Collection](#)



[EMS Response to the Current Outbreak of Monkeypox](#)



[Monkeypox: RESPTC Perils and Pearls Zoomcast: Episode 22](#)



[Monkeypox: Infection Prevention Controls and Waste Management](#)



[Laboratory Resources: Monkeypox](#)



[Identify, Isolate, Inform: Assessment, Management, and Placement of Persons Under Investigation](#)



[Transmission Interrupted: Back to Basics: PPE and Monkeypox](#)



[CDC Confirms U.S. Case of Monkeypox](#)



[EMS Considerations for Monkeypox: Identify, Isolate, and Inform](#)

Monkeypox - Presentation



UNMC/Nebraska Medicine Public Resources



DOCTORS

LOCATIONS

SERVICES

PATIENTS AND VISITORS



How does monkeypox spread? 9 common questions and how to protect yourself



Home / Monkeypox / How does monkeypox spread? 9 common questions and how to protect yourself

Published August 3, 2022



BEST
REGIONAL HOSPITALS
U.S. News & World Report
OMAHA METRO
RECOGNIZED IN 15 TYPES OF CARE
2021-22

Call For An Appointment

800.922.0000

Learn more about monkeypox

Home / Monkeypox

Monkeypox

Call to get tested
800.922.0000



DOCTORS

LOCATIONS

SERVICES

PATIENTS AND VISITORS

Home / Monkeypox / Other helpful monkeypox resources

< MONKEYPOX

Other helpful monkeypox resources

Other helpful monkeypox resources

Helpful monkeypox resources

- [CDC.gov: Monkeypox](https://www.cdc.gov/monkeypox/)
- [CDC.gov: 2022 United States monkeypox case](https://www.cdc.gov/media/releases/2022/s0803-monkeypox.html)
- [CDC.gov: Questions and answers about monkeypox](https://www.cdc.gov/media/releases/2022/s0803-monkeypox.html)
- [npr: Monkeypox declared a public health emergency](https://www.npr.com/2022/07/29/1101111111/monkeypox-declared-a-public-health-emergency)
- [NETEC.org: EMS response to the current outbreak of monkeypox](https://www.netec.org/news/2022/07/29/ems-response-to-the-current-outbreak-of-monkeypox)
- [NETEC.org: Outbreak update: Monkeypox outbreak in the U.S.](https://www.netec.org/news/2022/07/29/outbreak-update-monkeypox-outbreak-in-the-u-s)
- [NETEC.org: Monkeypox: NETEC special pathogen of concern situation report May 2022](https://www.netec.org/news/2022/07/29/monkeypox-netec-special-pathogen-of-concern-situation-report-may-2022)
- [Nebraska DHHS Health Alert Network update: July 2022](https://www.netec.org/news/2022/07/29/nebraska-dhhs-health-alert-network-update-july-2022)

<https://www.nebraskamed.com/infectious-diseases/monkeypox>

UNMC/Nebraska Medicine Provider Resources

VIRAL HEMORRHAGIC FEVER AND ORTHOPOXES

- [ED Workflow Screening: VHF + Orthopoxes](#)
- [VHF Lab Protocol](#)
- [Viral Hemorrhagic Fevers Matrix from NETEC](#)

Monkeypox

- [Monkeypox SBAR \(updated June 24, 2022\)](#)
- [Monkeypox Specimen Collection – Preferred Method \(updated Aug. 22, 2022\)](#)
- [Monkeypox Specimen Collection for Inpatient Admission \(updated Aug. 23, 2022\)](#)
- [Videos from NETEC \(Updated July 25, 2022\)](#)
 - [Quick education module on specimen collection](#)
 - [Specimen collection](#)
 - [How to break a monkeypox specimen collection swab's shaft](#)
- [Example of Completed NPHL Requisition \(updated July 27, 2022\)](#)
- [Monkeypox Cleaning Disinfection and Waste Process \(updated July 1, 2022\)](#)
- [Monkeypox environmental cleaning and disinfection checklist – will download to your computer when you click on the link; check your downloads folder for Word file \(Updated June 30, 2022\)](#)
- [Infectious Disease Room Log Sheet \(updated July 8, 2022\)](#)
- [Monkeypox Virus Presentation at a Clinic Process Flow \(updated Aug. 23, 2022\)](#)
- [Monkeypox Virus Presentation at Emergency Department \(updated Aug. 19, 2022\)](#)
- [Monitoring Exposed Health Care Workers \(updated June 28, 2022\)](#)
- [Department of Homeland Security Master Question List \(updated Aug. 8, 2022\)](#)
- [Tecovirimat Guidance and CDC Requirements \(updated Aug. 12, 2022\)](#)

<https://now.nebraskamed.com/infectious-diseases-protocols/>

Monkeypox - Presentation



NE ICAP Resources



About Us ▼ COVID-19 ▼ Facilities ▼

Looking for Monkeypox resources? You can find them [here](#).

[Home](#) > Monkeypox Resources and Updates

Monkeypox Resources and Updates



You can find resources, information and updates on the ongoing 2022 Monkeypox outbreak. Click on the dropdown menu below to show the most up-to-date resources from different organizations.

Monkeypox Resources

Monkeypox Testing and Transport +

HAN Advisories +

CDC/WHO +

FDA +

Healthcare Resources ×

<https://icap.nebraskamed.com/monkeypox-resources-and-updates/>

Advice to Public - What to do if you have monkeypox

- Most persons recover fully in 2-4 weeks without need for medical treatment
- Persons at high risk (e.g. children, pregnant women, immunosuppressed, genital or rectal lesions) may need treatment.
- Isolate until skin lesions have healed and new layer of skin has formed (<https://www.cdc.gov/poxvirus/monkeypox/if-sick/preventing-spread.html>)
- Keep rash/lesions covered; do not shave area with rash; do not touch or scratch lesions
- Wash hands frequently; wear a well-fitting mask if around other people
- Tylenol or Motrin for pain; salt-water rinse for oral lesions or “magic mouthwash”
- Notify close contacts so they can monitor, test, and vaccinate (<https://www.cdc.gov/poxvirus/monkeypox/if-sick/notifying-close-contacts.html>)
- Disinfect surfaces with EPA-registered disinfectant (<https://www.epa.gov/pesticide-registration/disinfectants-emerging-viral-pathogens-evps-list-q>)

Testing

- Low threshold to test those persons with rash and risk factors
- Tests employ nucleic acid amplification (NAAT) to detect the DNA of the virus
- Specimens can be tested via Nebraska Public Health Lab: (<https://www.nphl.org/>) and can be ordered via NUIirt (<https://www.nphl.org/documents/Outbreak%20ordering%20quickstart.pdf>)
- Specimens can also be tested at commercial labs: ARUP, Mayo, Quest, etc.
- UNMC/NM is developing FDA-approved in-house assay to improve speed and convenience of testing (same-day results)



<https://netec.org/2022/07/26/how-to-collect-a-monkeypox-specimen-for-diagnostic-testing/>

Treatment

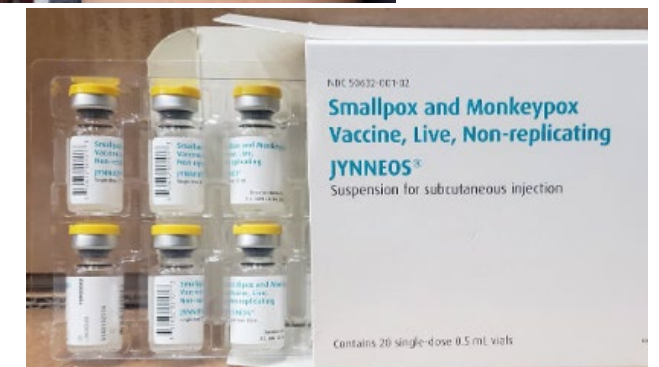
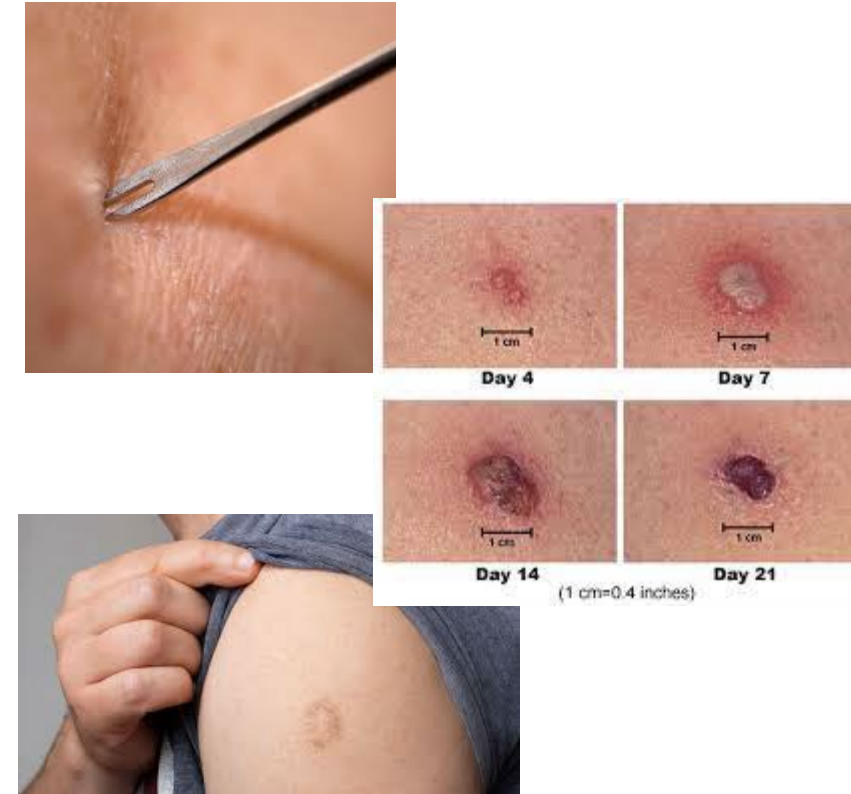
- Symptomatic/supportive care; No specific monkeypox treatment
- Tecovirimat (TPOXX)
 - Approved for smallpox Rx (via animal rule). Available via CDC EA-IND for monkeypox. (<https://www.cdc.gov/poxvirus/monkeypox/clinicians/Tecovirimat.html>)
 - Recommended for those with severe illness, high risk conditions, or lesions in highly sensitive locations
 - Antiviral medication that inhibits envelop wrapping protein P37
 - Oral or IV x 14 days. Take with high fat meal. Several clinical trials via NIH, ACTG, WHO in progress. UNMC/NM Specialty Care Clinic is site for ACTG trial.
 - Limited clinical data – small series indicate clinical response; main side effects: nausea, headache, fatigue
 - Other alternatives: Vaccina IGIV, Cidofovir, Brincidofovir



Monkeypox - Presentation

Vaccination

- Routine smallpox vaccination in US was halted in 1972
- ACAM2000 – live Vaccinia virus, can spread to other sites or to other people, myocarditis/pericarditis 1:175, 200M doses in national stockpile in case of smallpox outbreak
- JYNNEOS
 - Live virus, non-replicating (cannot spread to other sites or other people)
 - 2-doses - 4 weeks apart; 85% effective in studies in Africa
 - 1.1M vials available, 5.5 M vials on order
 - Approval for intradermal administration (5 doses per vial vs 1 dose)
 - Post-exposure prophylaxis: Best if within 4 days of exposure
 - Pre-exposure prophylaxis: DoCo Health Dept:
 - <https://www.douglascountyhealth.com/infectious-disease/diseases-and-conditions/monkeypox>
 - 8/29/2022: 1281 vials have been shipped to NE



Public Health Messaging & Communication – Critical! Target higher risk groups without stigmatization

Gay, bisexual, and other men who have sex with men are taking steps to protect themselves and their partners from monkeypox.



MMWR Morb Mortal Wkly Rep.
ePub: 26 August 2022.
DOI: <http://dx.doi.org/10.15585/mmwr.mm7135e1>.

Public Health & Infectious Diseases Specialists Workforce



- The COVID-19 pandemic with the resultant increased workload, stress, and politicization of public health has resulted in widespread “burnout” of the workforce and a system that is overly taxed and poorly resilient.
- 56% of public health workers report at least one symptom of PTSD
- 51% of ID specialists are “burned-out”

Nearly 1 in 3 public health employees say they are **considering leaving their organization within the next year**

An icon consisting of three stylized human figures. The first figure on the left is colored orange, while the two figures on the right are grey, representing the statistic that nearly 1 in 3 employees are considering leaving.

Public Health Workforce interests and Needs Survey. 2021. https://debeaumont.org/wp-content/uploads/dlm_uploads/2022/03/Stress-and-Burnout-Brief_final.pdf

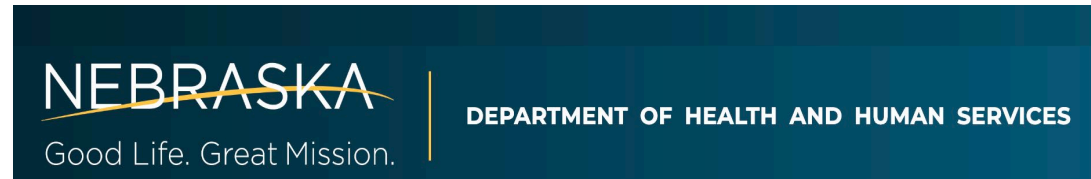
Medscape Infectious Diseases Survey. 2022. <https://www.staging.medscape.com/slideshow/2022-lifestyle-infectious-disease-6014772>

Can we gain control of Monkeypox Outbreak – Yes! Will it be easy – No!

- Disease appears to be primarily spread via close/intimate contact – less risk of airborne or respiratory droplet spread; largely contained to high-risk group (at present)
 - Persons who recover have lifelong immunity
 - There is an effective vaccine
 - There is effective treatment
-
- Caution....
 - Stigmatization will drive outbreak underground
 - Virus does not recognize borders – not a “gay-disease” or “African disease”
 - May become endemic in wild rodents
 - Likely to become low level endemic illness in US



Monkeypox - Presentation



<https://dhhs.ne.gov/Pages/Monkeypox.aspx>

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

<https://www.unmc.edu/healthsecurity/index.html>

