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Monkeypox
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What is Monkeypox (MPX)?

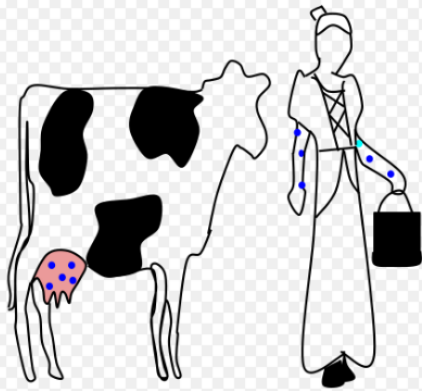
- MPX is an orthopox virus
- Other human orthopox viruses include:
 - Variola virus (smallpox)
 - Vaccinia virus (smallpox vaccine)
- Discovered in 1958 in outbreaks in colonies of monkeys kept for research
- Despite being named monkeypox, the source remains unknown
- Zoonotic disease (transmitted to humans from animals)

Fun Fact

- Cowpox virus, an orthopox virus much less virulent than smallpox, was introduced by Edward Jenner in the late 18th Century as the material of the 1st vaccine.
- He noticed that milkmaids were generally immune to smallpox and postulated that the pus in the blisters that milkmaids received from cowpox protected them from smallpox.



Fun Fact



Sarah Nelmes, a milkmaid infected with cowpox.



James Phipps is inoculated with cowpox pus from Nelmes.



Phipps falls ill with a mild case of cowpox.



Scabs are collected from a smallpox patient.



Phipps is inoculated with the scabs of smallpox.



Phipps is unaffected. Protection is complete.

Fun Fact

- 1977 - last case of smallpox occurred
- 1980 - smallpox declared eradicated worldwide after global campaign of vaccination and containment
- >40 years since routine smallpox vaccination
- Since smallpox vaccination also protected against MPX in west and central Africa, unvaccinated populations are now more susceptible to MPX virus infection

The Tale of Two Clades

- **Clade I** (formerly Congo Basin or central African)
 - Causes more severe disease
 - Case-fatality rates ~10%
 - More transmissible
- **Clade II** (formerly known as west African)
 - Rarely fatal
 - 2 subclades (Clade IIa and Clade IIb)
 - Clade IIb = cause of current global outbreak
- Proteins are thought to cause the various human disease manifestations between the clades

Human Cases

- 1st case documented in 1970 in DRC
- Historically -
 - Reported in several central and western African countries
 - International cases linked to travel to countries where the disease commonly occurs or through imported animals (e.g., 2003 70+ cases in U.S. from infected prairie dogs that had been housed with Gambian pouched rats and dormice that were imported from Ghana)
- Currently -
 - global outbreak of Clade IIb (West African Clade)



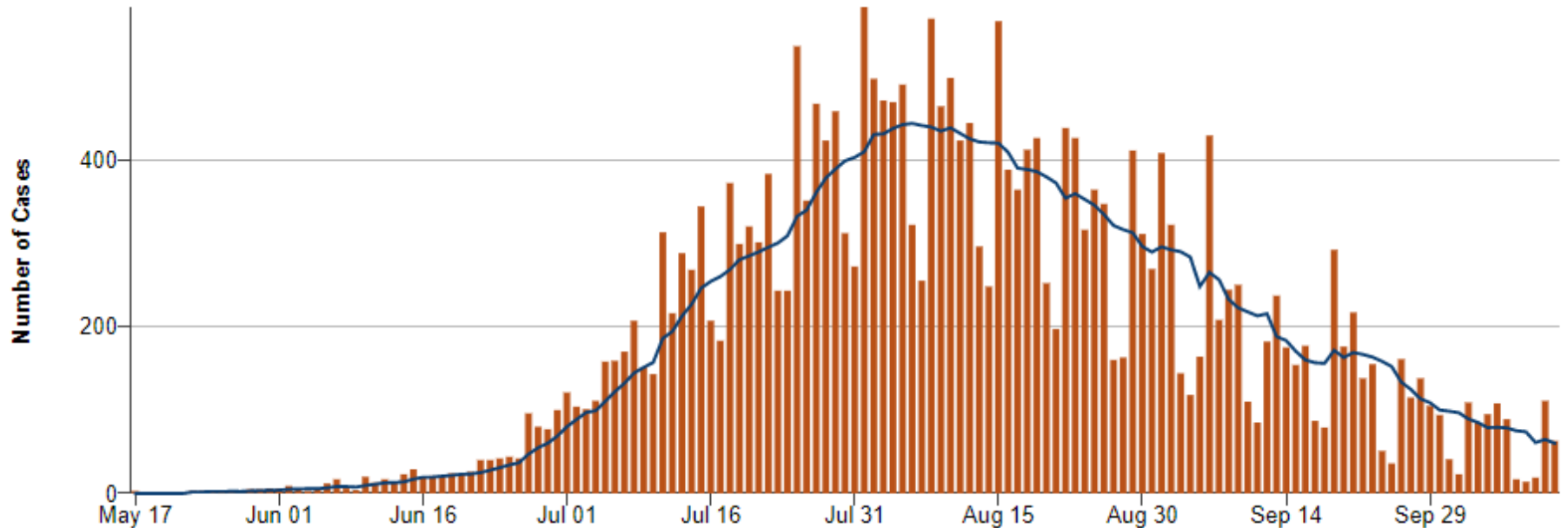
Epidemiology

- Current data suggests that gay, bisexual, and other men who have sex with men make up the majority of cases in the current MPX outbreak.
- However, anyone who has been in close, personal contact with someone with MPX is at risk.
- As of 10/12/22:
 - Confirmed Cases
 - 72,457 confirmed cases worldwide
 - 27,022 confirmed cases in the U.S.
 - 687 confirmed cases in Maryland
 - Deaths
 - 26 worldwide
 - 2 U.S.
 - 0 Maryland
 - Individuals Vaccinated
 - 906,325 in U.S.
 - 7,010 in Maryland

Epidemiology

Trends of monkeypox cases reported to CDC since May 17, 2022, the start of the response to the current outbreak in the United States. Data include cases with reporting date.*

Daily Monkeypox Cases Reported* and 7 Day Daily Average



Signs and Symptoms

- **Rash**
 - may be located on or near the genitals or anus
 - could be on other areas like hands, feet, chest, face, mouth
- **Fever**
- **Chills**
- **Swollen Lymph Nodes**
- **Rectal pain/proctitis**
- **Exhaustion**
- **Muscle Aches and Backache**
- **Headache**
- **Respiratory Symptoms**
 - e.g., sore throat, nasal congestion, or cough

Signs and Symptoms

- May have flu-like symptoms before the rash
 - Classic presentation
- May get the rash first followed by other symptoms
 - Different from classic presentation
- May only get the rash
 - Different from classic presentation

The Rash



- The rash will go through several stages before healing
 - Macules (lesions with a flat base)
 - Papules (raised firm painful lesions)
 - Vesicles (filled with clear fluid)
 - Pustules (filled with pus), often develop umbilication during this stage
 - Scabs/crusts
- Lesions firm or rubbery, well-circumscribed, deep-seated



Incubation and Disease Progression

- The incubation period may be up to 21 days after exposure
- MPX may be spread from the time symptoms begin until all rashes have healed, all scabs have fallen off, and a fresh layer of skin has formed.
- MPX typically lasts 2-4 weeks

How it Spreads

- Close or Intimate Contact
 - Direct contact with MPX rash, scabs, body fluids, respiratory secretions
 - Touching objects, fabrics, and surfaces that have been used by someone with MPX
- Mom to fetus via placenta
- Contact with infected animals including preparing or eating meat

If You Are Sick – Isolate at Home

- **Isolate at Home**

- Remain in a room away from other humans and animals.
- Use a separate restroom not shared by others.
- Cover upholstered furniture and porous materials that cannot be washed (e.g., sheets, blankets, tarps).
- Do not share items with others (e.g., linens, clothing, cups, dishes, eating utensils, etc.)
- Do not leave your home for work or any reason other than emergencies (e.g., fire, medical).
- Have all supplies delivered without direct contact with others.



If You Are Sick – Notify Close Contacts

- **Notify Close Contacts**

- Instruct them to watch for signs/symptoms for 21 days post exposure.
- They should contact the DOH or their primary care doctor to assess if they need post exposure vaccination dependent on their risk level of exposure and underlying comorbidities.
- Refer to next slides for interim community exposure risk assessment and recommendations for monitoring and postexposure prophylaxes in individuals exposed to MPX in a community setting

Higher Degree of Exposure

Degree of Exposure: **Higher**

Recommendations

- Monitoring: Yes
- PEP[†]: Recommended

Exposure Characteristics

- Contact between an exposed individual's broken skin or mucous membranes with the skin lesions or bodily fluids from a person with monkeypox -OR-
- Any sexual or intimate contact involving mucous membranes (e.g., kissing, oral-genital, oral-anal, vaginal, or anal sex (insertive or receptive)) with a person with monkeypox -OR-
- Contact between an exposed individual's broken skin or mucous membranes with materials (e.g., linens, clothing, objects, sex toys) that have contacted the skin lesions or bodily fluids of a person with monkeypox (e.g., sharing food, handling or sharing of linens used by a person with monkeypox without having been disinfected[‡] or laundered)

Intermediate Degree of Exposure

Degree of Exposure: **Intermediate**

Recommendations

- Monitoring: Yes
- PEP[¶]: Informed clinical decision making recommended on an individual basis to determine if the benefits of PEP outweigh the risks

Exposure Characteristics

- Being within 6 feet for a total of 3 hours or more (cumulative) of an unmasked person with monkeypox without wearing a surgical mask or respirator -OR-
- Contact between an exposed individual's intact skin with the skin lesions or bodily fluids from a person with monkeypox -OR-
- Contact between an exposed individual's intact skin with materials (e.g., linens, clothing, sex toys) that have contacted the skin lesions or bodily fluids from a person with monkeypox without having been disinfected[†] or laundered -OR-
- Contact between an exposed individual's clothing with the person with monkeypox's skin lesions or bodily fluids, or their soiled linens or dressings (e.g., during turning, bathing, or assisting with transfer)

Lower Degree of Exposure

Degree of Exposure: **Lower**

Recommendations


- Monitoring: Yes
- PEP[†]: None

Exposure Characteristics

- Entry into the living space of a person with monkeypox (regardless of whether the person with monkeypox is present), and in the absence of any exposures above

Abbreviations: PEP=postexposure prophylaxis

¶ JYNNEOS and ACAM2000 are available for PEP

+ Disinfection using a disinfectant registered with the U.S. Environmental Protection Agency (EPA), such as those with an emerging viral pathogens claim found on EPA's [List Q](#) 

Factors that may increase the risk of monkeypox transmission include (but are not limited to): the person with monkeypox had clothes that were soiled with bodily fluids or secretions (e.g., discharge, skin lesion crusts or scabs on clothes) or was coughing while not wearing a mask or respirator, or the exposed individual is not previously vaccinated against smallpox or monkeypox. People who may be at increased risk for severe disease include (but are not limited to): young children (<8 years of age), individuals who are pregnant or immunocompromised, and individuals with a history of atopic dermatitis or eczema.



If You Are Sick – Clean and Disinfect



- **Home Cleaning and Disinfection**

- MPX can survive on linens, clothing and environmental surfaces.
- **Clean and disinfect living spaces regularly** to limit household contamination.
 - High touch areas include tables, countertops, door handles, toilet flush handles, faucets, light switches, and floors
- **Do not dry dust or sweep.** Use disinfectant wipes, sprays, and wet mopping. If vacuuming, use a high-efficiency air filter or wear a respirator.
- If cleaning and disinfection is completed by a person without MPX, **where personal protective equipment (PPE)** (disposable gloves, well-fitted mask or respirator, and clothing that fully covers their arms and legs should be worn).
- Once recovered and isolation has ended, the person with MPX should clean and disinfect their entire living space including laundering any linens in the home.
- **Waste** should be placed in a sealed bag and gloves worn when removing garbage

If You Are Sick – Clean and Disinfect

- **Home Cleaning and Disinfection cont'd**
 - Use a **disinfectant from the EPA List Q [Disinfectants for Emerging Viral Pathogens \(EVPs\): List Q | US EPA](#)** (e.g., many Lysol products, Arm & Hammer Essentials Disinfecting Wipes, many Clorox products)
 - Note wet times
 - Note if approved for nonporous or porous surfaces
 - If soft (porous) surfaces are contaminated such as upholstered furniture, carpets, or rugs, **steam clean** them.
 - **Wash your hands after removing gloves** with soap and water. If soap and water is unavailable, use alcohol-based hand sanitizer with at least 60% alcohol.
- **Contaminated Linen**
 - Do not shake or handle in a way to disperse particles into the air
 - Place in a waterproof container or bag that can be disinfected or thrown away
 - Wash in standard washing machine with detergent

If You Are Sick – Clean and Disinfect

- Home Cleaning and Disinfection **Community Setting**
 - If a person with MPX was in your facility, clean and disinfect the space
 - Focus on surfaces that were in contact with the skin of the person with MPX
 - Wear PPE: disposable gloves, well-fitted mask or respirator, eye protection and isolation gown.
 - Notify cleaning services if applicable so they may take precautions
 - Follow recommendations in previous slides on cleaning and disinfection



Testing

- Testing is only recommended if you have a rash consistent with MPX
- STEPS FOR GETTING TESTED:
 - Obtain an order from your physician for monkeypox testing.
 - If you do not have a physician, use [MeritusNow](#) or [Meritus Urgent Care](#) to obtain an order for testing.
 - Call the laboratory at Crayton Blvd., (301-790-8670) to schedule an appointment.
 - Upon arrival, park in front of the lab, remain in your vehicle and call the lab (301-790-8670).
 - Staff will escort you into the facility for swabbing.
 - Order is placed and swab is collected.
 - Any follow up needed will be provided via the physician who created the order.
 - At this time, testing is not being performed in-house, and we expect to receive results approximately 5-7 days after a test is collected.
 - The diagnostics company Cepheid has submitted to the FDA for emergency use authorization for testing kits. If approved, we would anticipate having availability for local testing and improved turnaround time within weeks.

Treatment

- Most patients with intact immune systems do not need treatment other than supportive care and pain control
- For those with at high risk for severe disease or who have severe disease, TPOXX may be considered
 - Weakened immune system
 - Younger than 8 years old
 - Pregnant or breastfeeding
 - Condition affecting skin integrity
- Tecovirmat (TPOXX)
 - FDA approved for the treatment of smallpox
 - Not FDA approved for treatment of MPX
 - CDC holds expanded access Investigational New Drug protocol (EA-IND) allowing for the use for primary or early empiric treatment of non-smallpox orthopox infections
 - Only available through the DOH/CDC

