What is Mpox?

Mpox (previously known as monkeypox) is a contagious disease caused by the monkeypox virus (MPXV), which belongs to the *Orthopoxvirus* genus in the *Poxviridae* family, which includes variola (smallpox), cowpox, vaccinia, and other viruses. There are two distinct clades of the virus: clade I (with subclades Ia and Ib) and clade II (with subclades IIa and IIb). Mpox can cause a painful rash, and flu-like symptoms. While most people fully recover, some can get very ill. Mpox is a zoonotic disease, meaning it can spread between animals and people. It is endemic in Cetral and West Africa. MPXV has been found in small rodents, monkeys, and other mammals that live in these regions. The reservoir is still currently unknown. The first case of mpox in humans was recorded in 1970 in the Democratic Republic of the Congo (DRC). In 2022, a global outbreak of Clade IIb began to spread around the world and is still ongoing. There are also growing outbreaks of clades Ia and Ib affecting the DRC and other countries in Africa. Gay, bisexual, and other men who have sex with men have thus far made up a large proportion of cases, however, anyone who has been in close contact with someone who has mpox is at risk, regardless of gender or sexual activity. The epidemiology for clade Ib in with the epicenter being in the DRC includes increased cases reported among children under the age of 15. Both clades are spread the same way and can be prevented using the same methods. Vaccines (e.g., JYNNEOS) and other medical countermeasures (e.g., tecovirimat, brincidofovir*, and vaccinia immune globulin intravenous) are available.

Clade I (subclades Ia and Ib)	**Clade II (subclades IIa and IIb)**
More transmissible and deadly with a current case fatality rate of 3-4%	Has a case fatality rate of <1%, with the highest risk among people who are severely immunocompromised, including uncontrolled HIV
Outbreaks of Clade Ia and Ib have recently occurred in several Central and Eastern African countries, including Democratic Republic of the Congo, the Republic of Congo, the Central African Republic, Cameroon, Rwanda, Burundi, Uganda, and Kenya. There have also been several travel-associated Clade I mpox cases reported in countries in other parts of Africa, Europe, Asia, and North America.	Clade IIb is the clade associated with the global mpox epidemic starting in 2022 and is still circulating at low levels in several countries, including the U.S. During the global outbreak, which includes the U.S., it has largely been associated with transmission among men who have sex with men. Clade IIa is more recently seeing an increasing number of cases being reported in several West African countries.
CDC risk assessment: Low, no community spread, only a low number of travel-associated cases	CDC risk assessment: still circulating at low levels

The WHO maintains an updated report of the African and Global situation here and CDC here.

**Brincidofovir must be requested and obtain an FDA-authorized single-patient emergency use IND.*

Disease Summary

Transmission:

- **Direct contact:**
  - Direct skin-to-skin contact with mpox rash or scabs from a person with mpox
  - Contact with saliva, upper respiratory secretions, body fluids or lesions around the anus, rectum, or vagina from a person with mpox

  - Oral, anal, or vaginal sex or touching the genitals (penis, testicles, labia, and vagina) or anus
- **Touching objects, fabrics, and surfaces** that have been used by someone with mpox and not disinfected (clothing, bedding, towels, dishes, utensils, fetish gear, or sex toys).
- **Prolonged face-to-face contact or intimate physical** contact (e.g. kissing, cuddling, massage, and sex) with infected person.
- Close contact with **wild animals**,
  - Specifically, small mammals like squirrels, rats, and mice that live in areas where mpox is endemic (found naturally, such as in West and Central Africa).
  - Direct close contact with an infected animal, fluids or waste, or getting bitten or scratched.
  - During activities like hunting, trapping, or processing infected wild animals in areas where mpox is endemic.
- Mpox virus can be spread to the fetus during **pregnancy** or to the newborn by close contact during and after birth.
- Close contact with **Pets**:
  - Less likely to get mpox from a pet, but possible
  - Direct contact with an infected pet including petting, cuddling, hugging, kissing, licking, and sharing sleeping spaces or food
- Those who have mpox should avoid contact with animals, including pets, to prevent spreading the virus to them
- Patient is infectious from time of symptom onset until all lesions have crusted over, fallen off, and new intact skin has formed underneath.
- Some people can spread mpox to others 1-4 days before their symptoms appear.

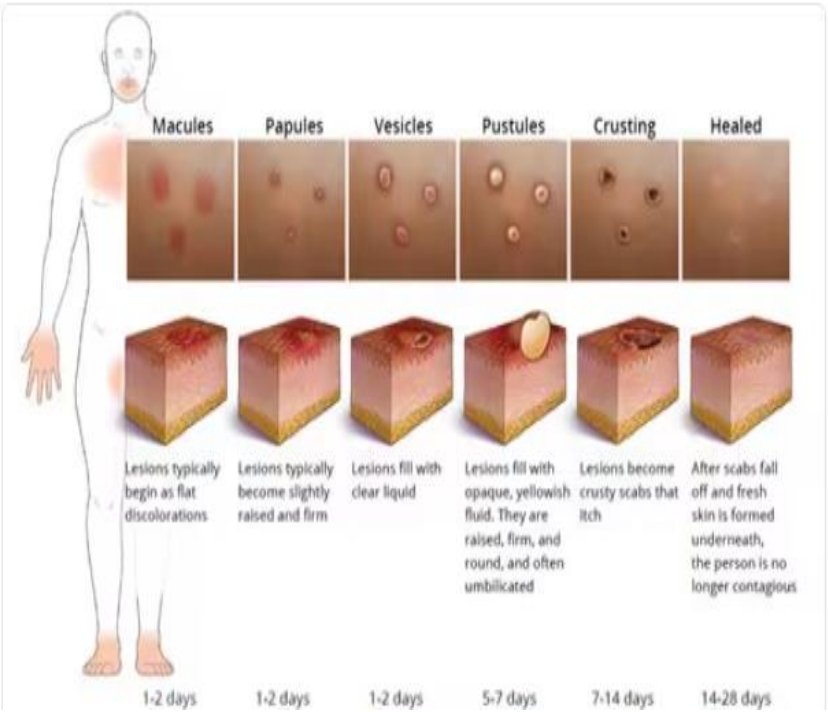
Incubation Period:

- 3-21 days
- Average is a week

Clinical Presentation:

- First symptoms maybe rash for some people, while others may have fever, muscle aches or sore throat first.
- Common symptoms:
  - Rash
  - Fever
  - Sore throat
  - Headache
  - Muscle aches
  - Back pain
  - Low energy
  - Swollen lymph nodes
  - Respiratory symptoms (e.g., nasal congestion or cough)
- A person may experience all or a few symptoms
- If person starts with flu-like symptoms, a rash will most likely develop 1-4 days later.
- Rash:
  - Often begins on face and spreads over body, extending to the palms of the hands and soles of the feet.

- Can also start on parts of body where contact was made, such as the genitals
- The rash typically evolves from a macule (flat), to a papule (raised), to a vesicle or pustule (fluid filled), then scabs. The rash is often well circumscribed, deep seated, and has central depression (umbilication).
- Lesions are often described as painful until the healing phase when they become itchy (crusts).
- Some may have one or a few skin lesions, while others may have hundreds or more.
- Rash presentation can be similar to varicella or some sexually transmitted infections (STI), such as syphilis, herpes, or lymphogranuloma venereum (LGV)



- Other manifestations of mpox include:
  - Painful proctitis
  - Dysuria
  - Pharyngitis
  - Ocular involvement (conjunctivitis, blepharitis, keratitis)

Complications:

- Those at higher risk for serious illness and death due to complications:
  - Children
  - Pregnant people
  - People with weak immune systems (e.g., those living with HIV that is not well controlled)
- Abscesses or serious skin damage
- Pneumonia
- Corneal infection with loss of vision
- Sepsis
- Encephalitis

- Myocarditis
- Proctitis
- Balanitis
- Urethritis
- Death

Note: mpox reinfection or infection after mpox vaccination can occur. Clinical presentation tends to be milder in these cases.

When to Suspect a Patient has Mpox

Suspect monkeypox virus in any individual who has a rash or lymphadenopathy or fever **AND** one or more of the following exposure risk factors within 3 weeks of symptom onset:

- Travel to / residence in a country known to have circulating mpox. Outbreak map located here
- Known/suspected exposure to ill person with suspected/confirmed mpox, including by:
  - Contact without appropriate PPE
  - Contact with objects contaminated by rash or bodily fluids (e.g., clothing, bedding, equipment) without appropriate PPE
  - Contact with rash/bodily fluids or contaminated objects with appropriate PPE if there is concern for a breach in PPE
- Contact with laboratory specimen for mpox without appropriate PPE
- Member of an exposed cohort or cohort experiencing an mpox outbreak
- Contact without the use of appropriate PPE with an animal with a known orthopoxvirus or mpox infection
- Contact with dead or live wild or exotic pet animal or an African species, or used or consumed a product derived from such an animal (e.g., game meat, powders, etc.)

Case Definition of Mpox Reinfection here.

Note: Diagnosis of an STI does not exclude mpox; concurrent infection may be present. If suspicion for mpox is not high, clinicians may consider instructing the patient to isolate at home for 5 days after the start of fever/prodromal symptoms. During this period, the patient should watch for the development of a rash. If no rash develops after 5 days, the patient may resume normal activity. However, if a rash develops, the patient should contact their PCP (or virtual care) for further instructions.

Key Steps for Frontline Clinical Staff

Identify	• Assess the patient for signs and symptoms, travel history, and other relevant recent exposures.
Isolate	• Provide a mask to the patient, cover any exposed lesions and initiate prompt isolation. Follow **Infection Prevention Guidance**
Inform	• If mpox **Clade I** is suspected, notify your facility's infection control department and facility leadership immediately. • If mpox **Clade I** is suspected , notify jurisdictional health department immediately (via the 24-hour Epi-On-Call contact list) and follow jurisdictional protocols for patient assessment.

Infection Prevention and Control for Mpox

Hand Hygiene

- Perform hand hygiene before and after all patient contact, contact with potentially infectious material, and before putting on and upon removal of PPE, including gloves.
- Use soap and water for at least 20 seconds or use alcohol-based hand rubs. If hands are visibly soiled, use soap and water.

Patient Placement

- Place patient in a **single-person room** with a dedicated bathroom. Keep the door closed, minimize entry and exit, and avoid entry without appropriate PPE.
- Limit movement of the patient outside of the room. When outside the room, **patient should wear a facemask and cover exposed skin lesions** with a sheet or a gown.
- For aerosol-generating procedures (i.e., intubation, extubation, and any procedures likely to spread oral secretions), place patient in an **airborne infection isolation room.**
- If **Clade I** mpox is suspected or confirmed, prioritize placing patient in an **airborne infection isolation room,** and if not available, a single patient room with door closed. The patient should have a dedicated bathroom.

Transmission-Based Precautions & Personal Protective Equipment

- Adhere to **Enhanced Droplet + Contact + Eye Protection Precautions**. Use gown, N95 respirator, goggles or face shield, and gloves.
- Do not reuse or extend the use of PPE.
- For aerosol-generating procedures (i.e., intubation, extubation, and any procedures likely to spread oral secretions), use **Airborne + Contact + Eye Protection Precautions** and place patient in an **airborne infection isolation room.**
- Follow Donning and Doffing Checklist
    - Example: NYC Health + Hospitals SP Level 1

Environmental Infection Control

- MPXV is a **Category B infectious substance**: not in a form generally capable of causing permanent disability or life-threatening/fatal disease in healthy humans if exposure occurs.
- MPXV clinical waste can be managed as **regulated medical waste**.
- Clean and disinfect the patient's care area using an EPA registered disinfectant for appropriate contact times that has a label claim for emerging viral pathogen. Management of food service utensils, and medical waste should also be performed in accordance with routine procedures.
- Handle soiled laundry according to standard practices, avoiding contact with lesion material or bodily fluids that maybe present on the laundry. Soiled laundry should be gently placed and contained in appropriate laundry bags. Do not shake the linens as this could spread infectious materials.
- Activities such as dry dusting, sweeping, or vacuuming should be avoided. Wet cleaning methods are preferred.

Diagnostic Testing and Specimen Collection

- Mpox is diagnosed using real-time PCR tests that are available through many large commercial laboratories and your local, state, territorial or tribal health department.
- Clinician s should collect 2 swabs from each lesion (generally from 2-3 lesions) in case additional testing, such as clade-specific testing, is needed.
    - CDC Guidelines for Collecting and Handling Specimens for Mpox Testing

- If **Clade I** is suspected, **consultation and approval from jurisdictional health department is required for disease-specific diagnostic testing.** Call jurisdictional health department 24-hour Epi-On-Call contact.

Note: Test all sexually active people being evaluated for suspected mpox for HIV if their status is unknown.

Treatment and Immunization

- Currently no treatment approved for mpox.
- For most patients who do not have severe disease or risk factors for severe disease, supportive care and pain control will help them recover.
- Patients who are severely immunocompromised or have certain skin conditions, (e.g., eczema), are at particular risk of uncontrolled viral spread, which can be life-threatening. Treatment for these patients involve FDA regulated drugs and biologics (e.g., tecovirimat, brincidofovir, and vaccinia immune globulin intravenous)
- Vaccines (e.g., JYNNEOS) are available for both Clade I and Clade II mpox.
- Eligibility criteria for mpox vaccination can be found here. The vaccine consists of two doses separated by at least 28 days.

Note: *The CDC announced the conclusion of enrollment for the STOMP trial, confirming tecovirimat's safety but finding it does not shorten mpox lesion resolution. Tecovirimat remains accessible under the CDC's Expanded Access protocol for eligible patients, and its use is recommended alongside other antiviral treatments in consultation with the CDC.

Contact: SystemBiopreparedness@nychhc.org

References:

- CDC Mpox
- WHO Mpox