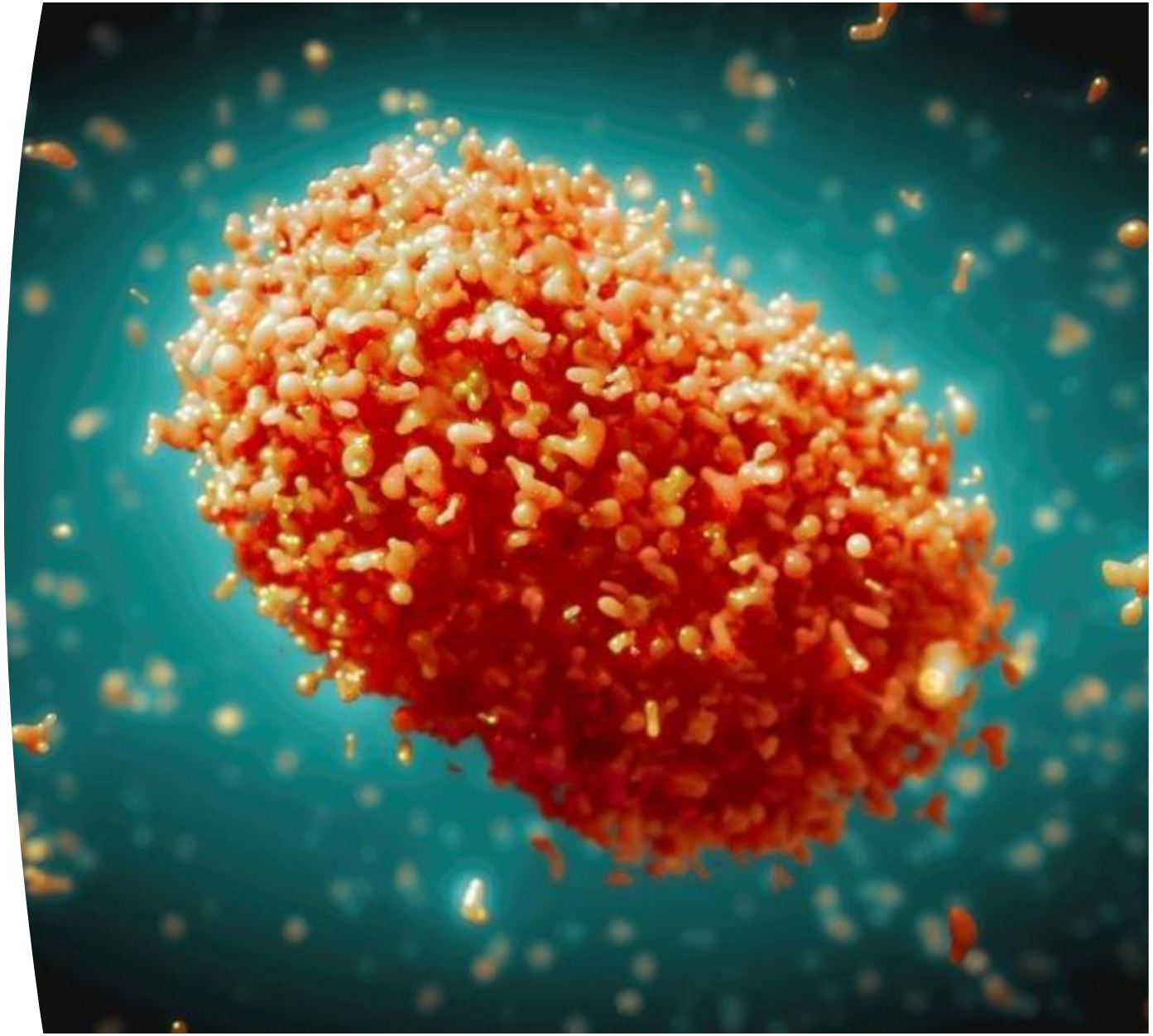
MPOX TESTING AND TREATMENT

ROBERT OWEN BRENNAN, MD, FACP, FIDSA

INFECTIOUS DISEASES ASSOCIATES OF CENTRAL VIRGINIA

FEBRUARY 8TH, 2024



EXPLICIT IMAGES

- All images obtained and presented with patient consent

HISTORY OF MPOX

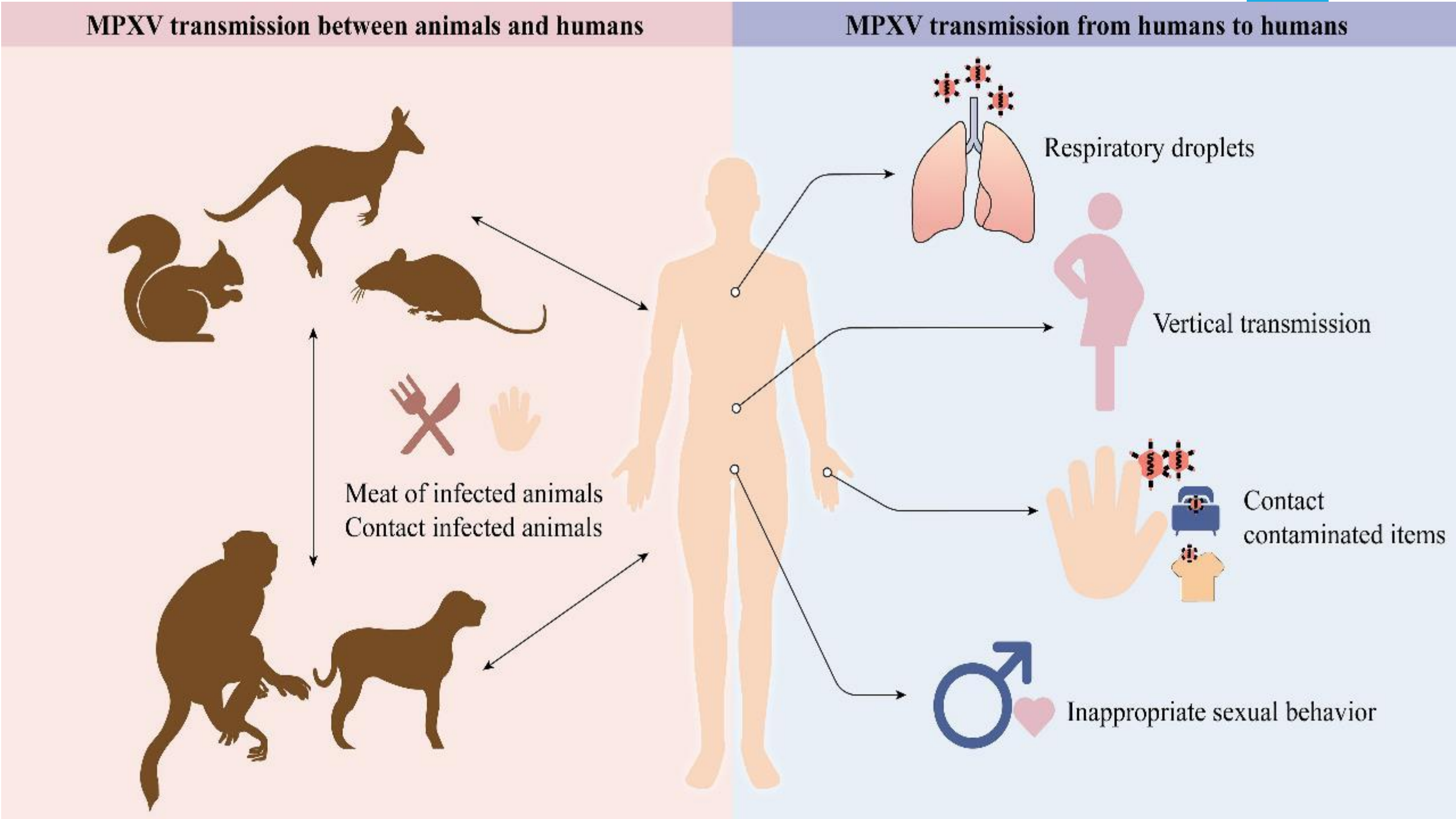
1950's – Monkeypox virus first isolated from lab animals in Denmark

1970's – Monkeypox virus first identified in infected humans in the Democratic Republic of the Congo & subsequently in central and west Africa.

2003 – First outbreak in US prairie dogs appeared to have acquired the virus from African rodents from Ghana when the two species were housed at a distribution center in Illinois.

Increase in cases in Africa corresponding to eradication of smallpox and subsequent discontinuation of smallpox vaccination programs.

2022 – Global outbreak of Mpox


MPXV transmission between animals and humans
MPXV transmission from humans to humans
Meat of infected animals
Contact infected animals
Respiratory droplets
Vertical transmission
Contact
contaminated items
Inappropriate sexual behavior

MPOX CLINICAL FEATURES

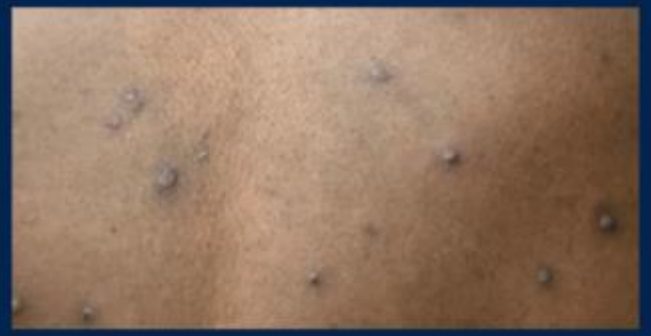
- Incubation period about 7-14 days
- Can have prodrome (1-4 days) fever, headache, adenopathy
  - Can present without prodrome, as well
- Eruptive phase (rash) 14-28 days
  - May have a range of lesion evolution
- Usually self limited, often resolving on its own
- Mortality rate in current outbreak: remains low (<0.2%)

CLINICAL FEATURES

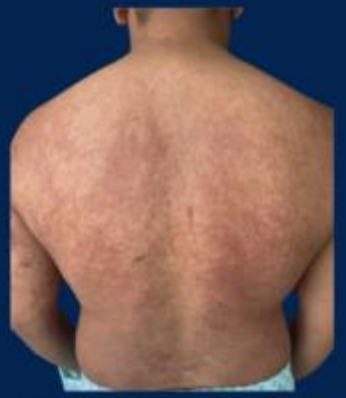
- Rash may be located on hands, feet, chest, face, or mouth or near genitals
  - May look like pimples or blisters initially
  - Lesions can be painful or itchy
- May also have fever, chills, fatigue, muscle aches, respiratory symptoms (sore throat, cough, nasal congestion)
- Illness generally self-limited and lasts 2-4 weeks
- Differential diagnoses may include: secondary syphilis, chancroid, herpes, chickenpox/shingles

MONKEYPOX RASH

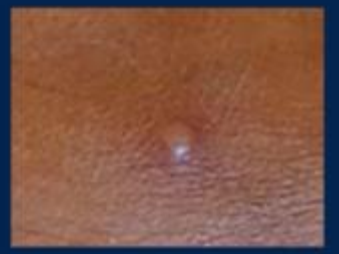
Can have widespread rash of various types or isolated lesions
2022 London case series, 11% had solitary lesion, 52% had 2-10 lesions



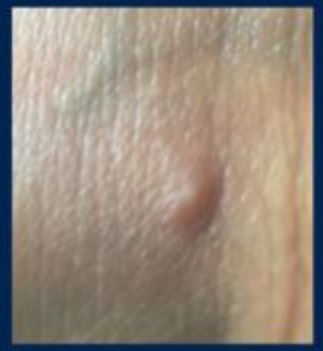
crusted, pustular, umbilicated



widespread maculopapular



vesicular



papular

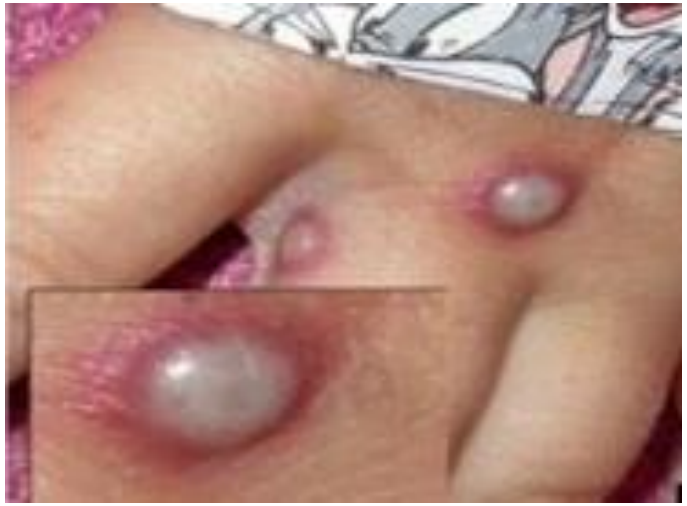
umbilicated

MIMICS

Hand, Foot, and Mouth, Syphillis, Herpes Zoster, Chickenpox

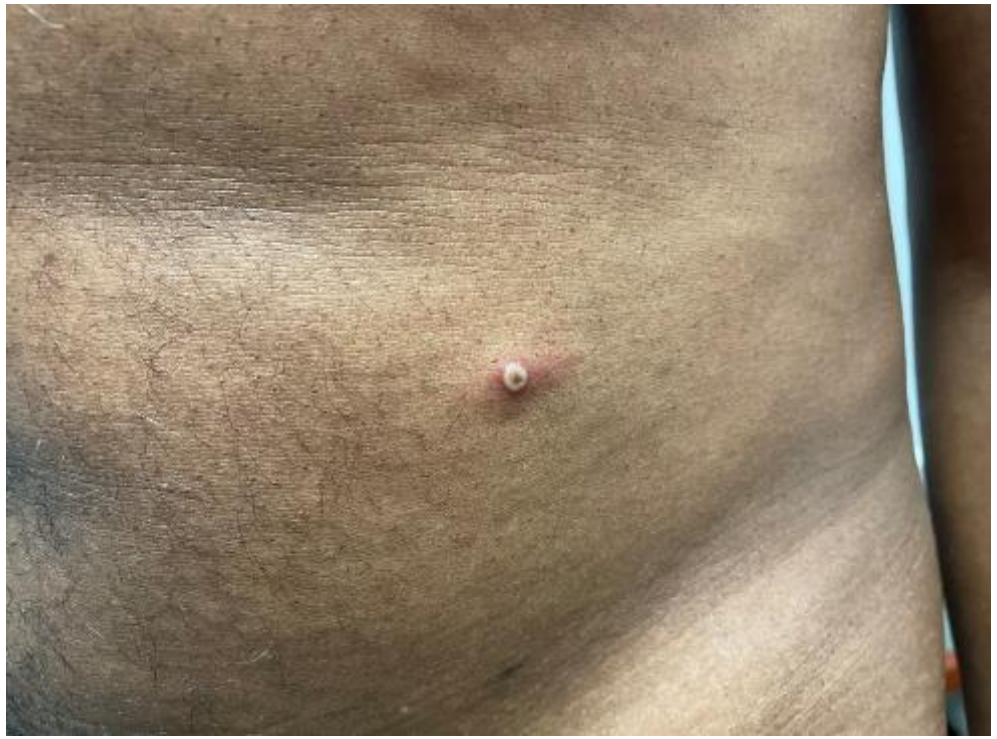
CLASSIC DISSEMINATED DISEASE

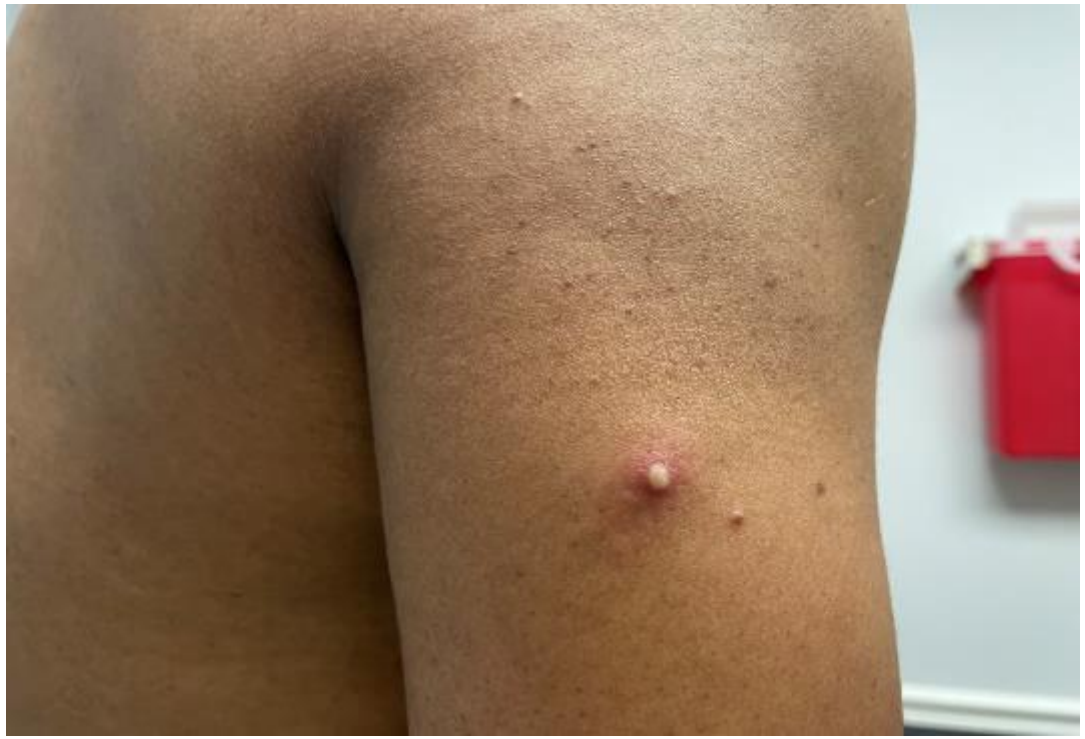
- Young children in central Africa - often with animal contact.
- Centrifugal distribution
- Rash 2-4 weeks
- Infectious until all lesions have fallen off
- Lesions same age
- Higher mortality rate



https://www.cdc.gov/poxvirus/monkeypox/clinicians/clinical-recognition.html

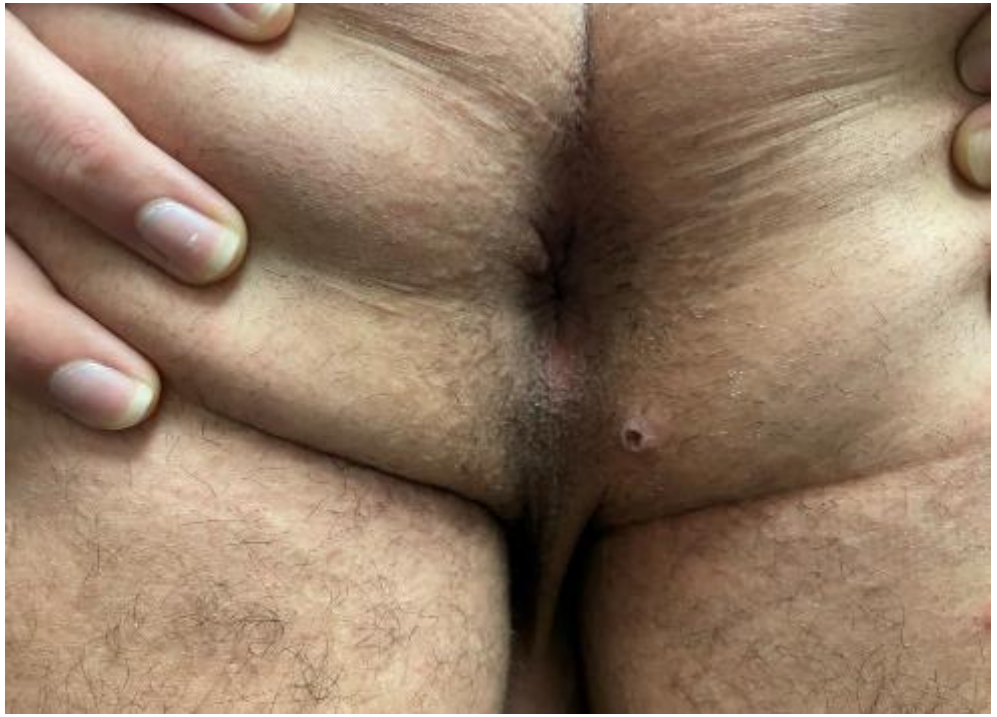
DISCRETE PUSTULAR LESIONS





Courtesy Dr David Wheeler

AFFINITY FOR GENITAL AND ANAL AREAS



Courtesy Dr David Wheeler

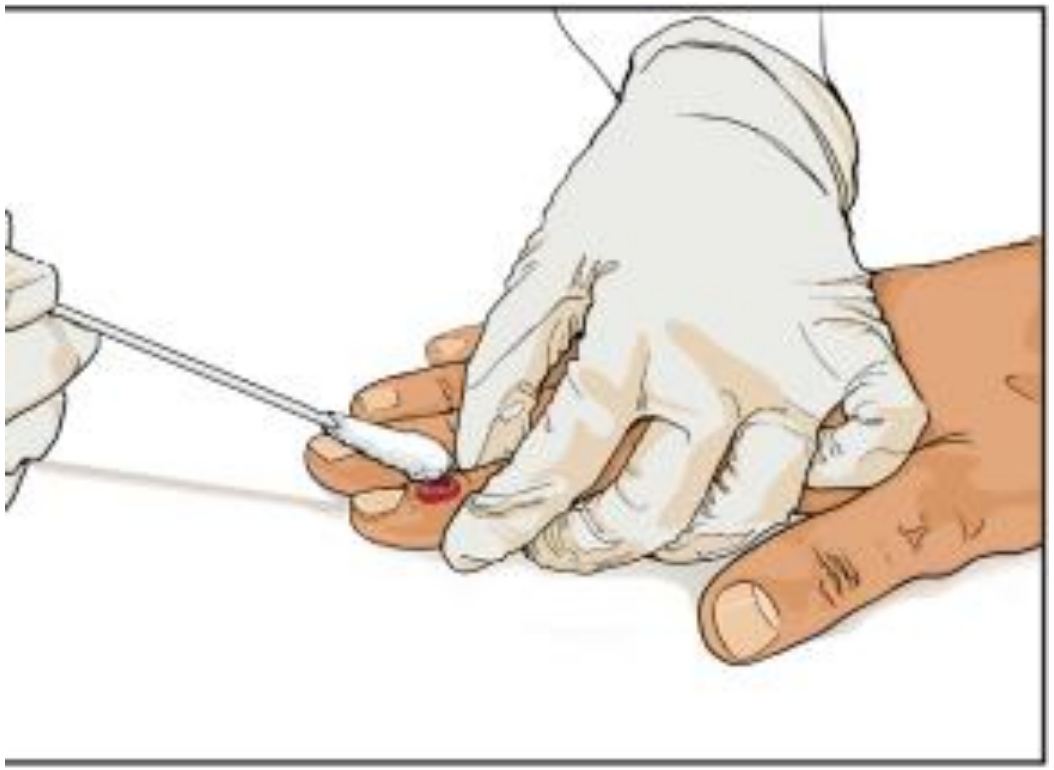
CASE DEFINITIONS FOR MPOX

- **Confirmed:** Meets confirmatory laboratory criteria *(Monkeypox virus detected)*
- **Probable:** Meets presumptive laboratory criteria *(Orthopoxvirus or IgM antibody detected)*
- **Suspected:** Meets either new characteristic rash or clinical suspicion with at least 1 of these epi criteria:
  - Close/sexual contact
  - Travel outside US
  - Animal or animal product

TESTING FOR MPOX INFECTION

- Detection of orthopoxvirus DNA by polymerase chain reaction testing of a clinical specimen.
- Detection of monkeypox virus DNA by polymerase chain reaction testing or next-generation sequencing of a clinical specimen.
- Detection of orthopoxvirus using immunohistochemical or electron microscopy testing methods.
- Isolation of monkeypox virus in culture from a clinical specimen.
- Demonstration of detectable levels of anti-orthopoxvirus IgM antibody 4 to 56 days after rash onset.

MPOX TESTING



- PCR test for non-variola orthopox viruses
- Initially thru the CDC and health departments
- Now thru commercial labs (Quest, LabCorp)
- Available thru health dept for eligible patients
- Variety of swabs
  - Dry, culture media
- Results in 48 hours

VDH TREATMENT STRATEGIES

SUPPORTIVE CARE FOR ALL PATIENTS

Assess and provide supportive care for pain management, skin and oral lesions, proctitis, gastrointestinal symptoms

Examples include:

- Over-the-counter or prescription pain medications
- Oral antihistamines for pruritic skin lesions
- Rehydration for fluid losses
- Anti-emetics for nausea and vomiting
- Sitz baths for proctitis or painful lesions

Most patients do not need antiviral treatment

Encouragement and guidance

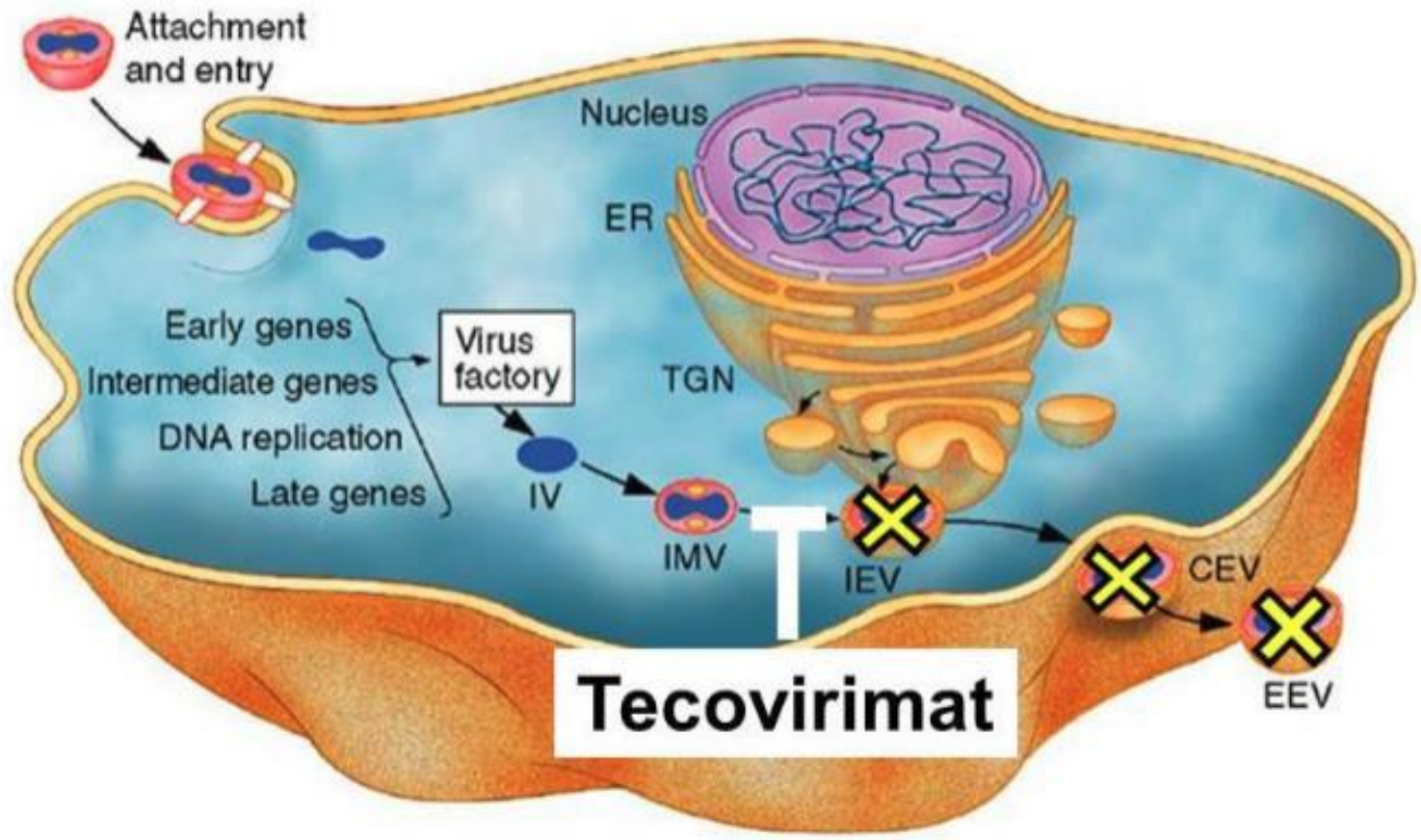
TREATMENT OPTIONS

Treatment Option	Indication	Formulations Available
Tecovirimat (TPOXX or ST-246) *Antiviral	Per EA-IND, for patients with laboratory confirmed non-variola orthopoxvirus infection or suspected infection based on known exposure(s) and/or clinical manifestations of disease	Oral (200 mg capsule)* Injection for intravenous administration *ability to mix with semi-solid food for pediatrics < 13 kg
Cidofovir (Vistide) *antiviral	FDA approved for treatment of cytomegalovirus retinitis in patients with AIDS	Intravenous infusion single-unit vial
Vaccinia Immune Globulin Intravenous (VIGIV)	FDA licensed for treatment of complications due to vaccinia vaccination	Intravenous infusion single-dose vial
Brincidofovir (Tembexa) *antiviral	FDA approved for the treatment of smallpox in adults and pediatrics, including neonates *As of 10/31/22, available from SNS through an e-IND request to FDA.	Oral (100 mg tablet or 10 mg/mL suspension)

MPOX TREATMENT

- Most people do not need antiviral therapy
- Tecovirimat 200 mg
  - Developed for smallpox in 2018
  - Animal and PK data
  - No clear data on monkeypox
- Brincidofovir, cidofovir
  - Excessive toxicity

TECOVIRIMAT INHIBITS THE MEMBRANE WRAP



STUDY OF TECOVIRIMAT ON HUMAN MPOX VIRUS (STOMP) CLINICAL TRIAL

Call Center: 1-855-876-9997 (U.S. only)

STOMP About the Study Participating Research Sites FAQs

NOW ENROLLING REMOTELY ACROSS THE UNITED STATES!

Call today for more information: 1-855-876-9997

[Study of Tecovirimat for Human Monkeypox Virus]

TREATMENT OPTIONS: TPOXX

- **CDC offers clinical consultation service (email eocevent482@cdc.gov) or call CDC Emergency Operations Center at 770-488-7100**
- Tecovirimat may be considered for people
  - With **severe disease** (e.g., hemorrhagic disease, confluent lesions, sepsis, encephalitis, ocular or periorbital infection, or other conditions requiring hospitalization)
  - With involvement of **anatomic areas** that might result in serious sequelae that include scarring or strictures
  - Who are at **high risk of severe disease**:
    - People with severe immunocompromise
    - Pediatric patients, particularly those younger than 1 year of age
    - Pregnant or breastfeeding women
    - People with a condition affecting skin integrity

CDC Treatment Information for Healthcare Professionals

MPOX: TREATMENT WITH TPOXX

- For adults and adolescents 40-120 kg
  - 3 capsules twice a day for 14 days

- Clinicians and patients should understand
  - Limited tecovirimat effectiveness data in people with mpox
  - Lack of data indicating which patients might benefit the most
  - Concern for development of resistance that could render the drug ineffective for any treated patients

- Alternate therapeutics have more concerning safety profiles than TPOXX

CDC Guidance for Tecovirimat Use

AVAILABILITY OF TPOXX

- Website: search "Mpox, VDH"
  - Scroll down to "For health providers, treatment guidance"

- Guidance for obtaining Tpoxx
  - First priority is to enroll on the clinical trial "STOMP"
  - Trial sites: VCU (currently on pause), Duke, Hopkins
    - Some availability for virtual visits

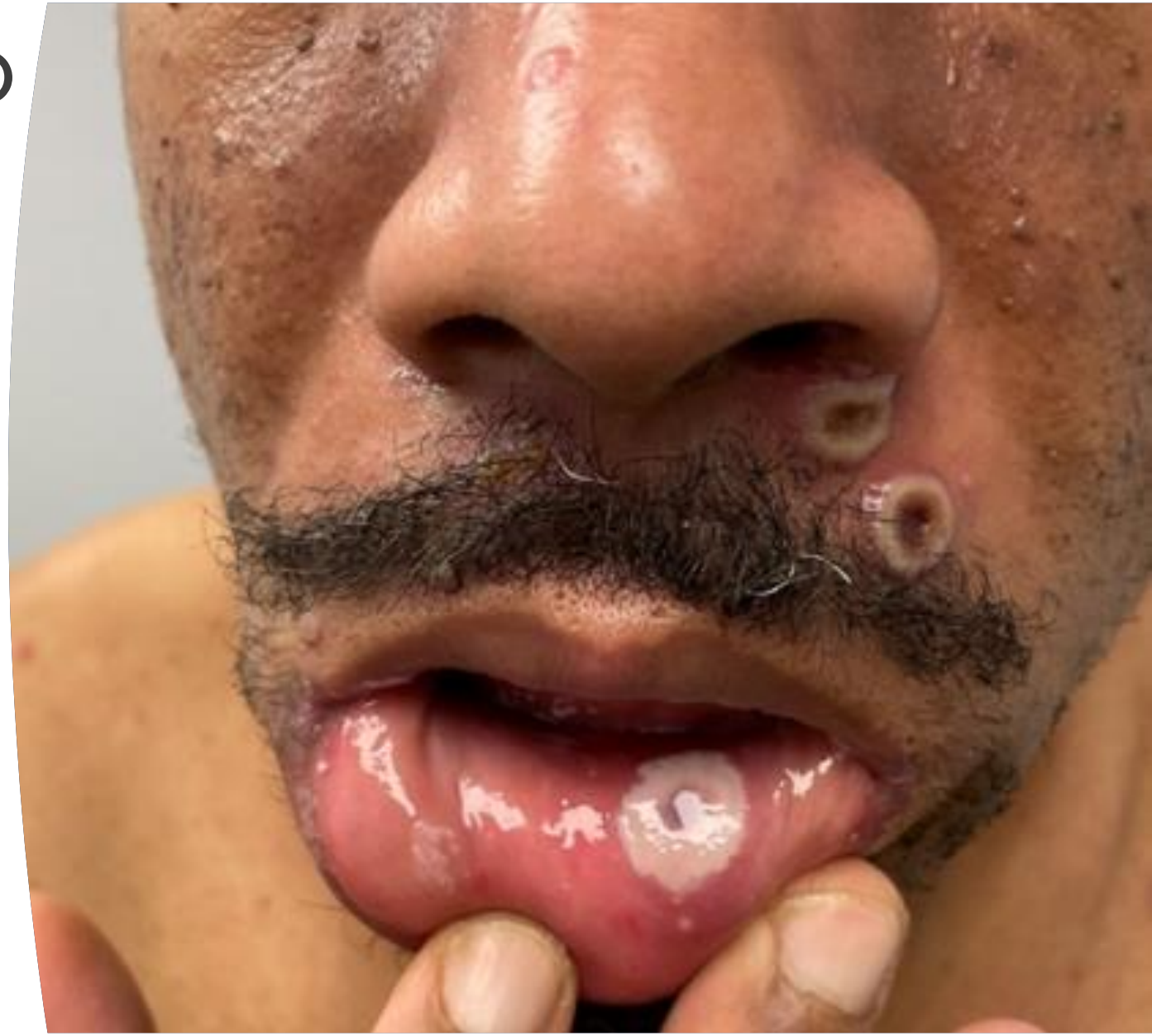
  - Availability of the drug through expanded access
    - Steps for registering as an investigator

STUDY OF TECOVIRIMAT ON HUMAN MPOX VIRUS (STOMP) CLINICAL TRIAL

- Preferred mechanism for TPOXX access is through STOMP Trial
- Funded by National Institute of Allergy and Infectious Diseases, part of the National Institutes of Health
- Clinical trial to evaluate the effectiveness of TPOXX
- Research site at Virginia Commonwealth University (VCU) – currently on pause
- Adults and children with mpox eligible to enroll, do not have to have severe mpox or be at increased risk of severe mpox
  - Aim to enroll > 500 people from up to 80 U.S. clinical research sites
- Open-label arm: those with or at risk of severe disease receive TPOXX
- Second arm: 530 adults randomly assigned in a 2:1 ratio to receive TPOXX or placebo pills for 14 days
- Patients not eligible or willing to enroll in STOMP can still get TPOXX via expanded access investigation new drug protocol

PATIENT WITH ADVANCED HIV AND MPOX

- Started on Tpoxx
- HIV testing: + CD4-17
  - Thrush
  - + RPR
- Developed dyspnea at day 10
  - Admitted to Fairfax
  - + PCP (treated with Bactrim)
    - Shortened course of steroids



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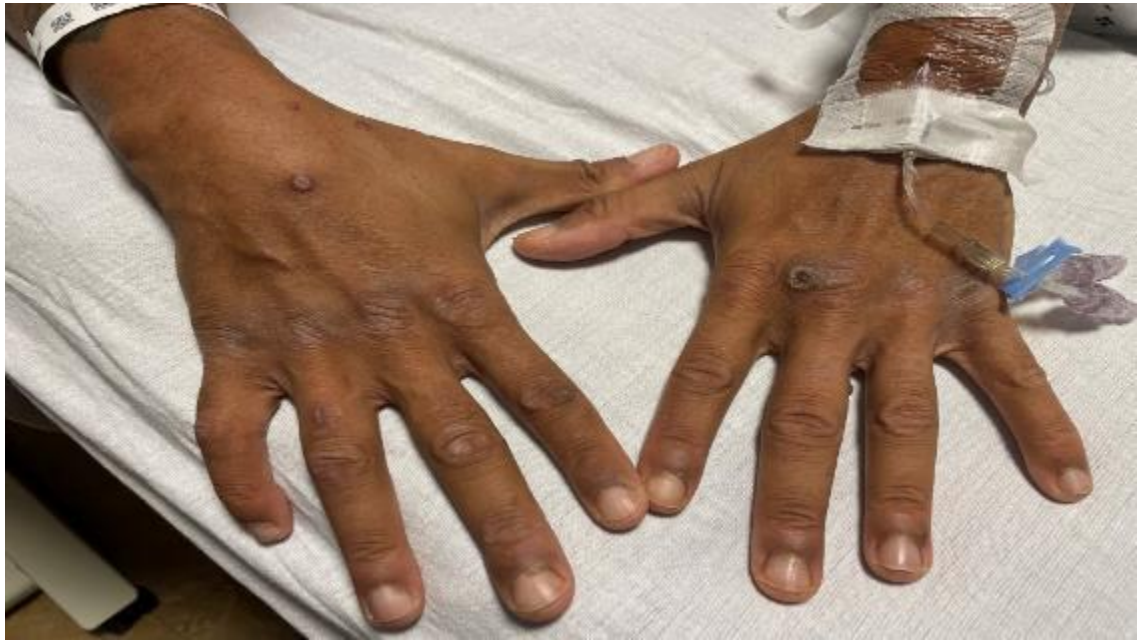
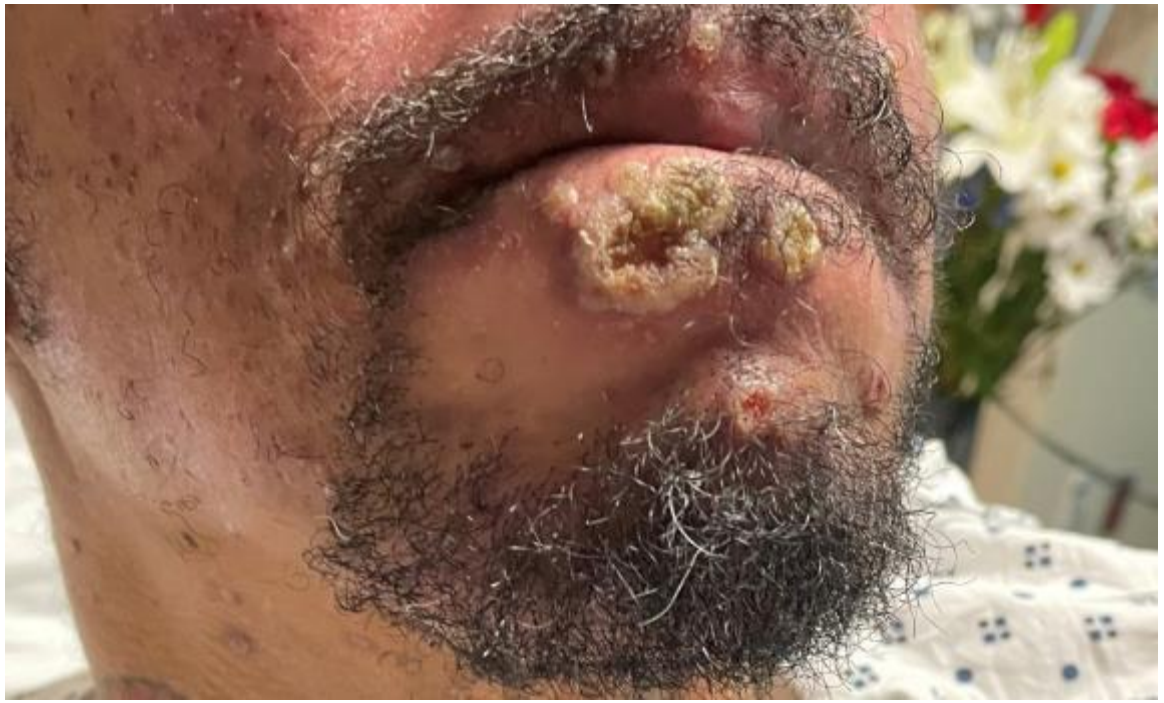
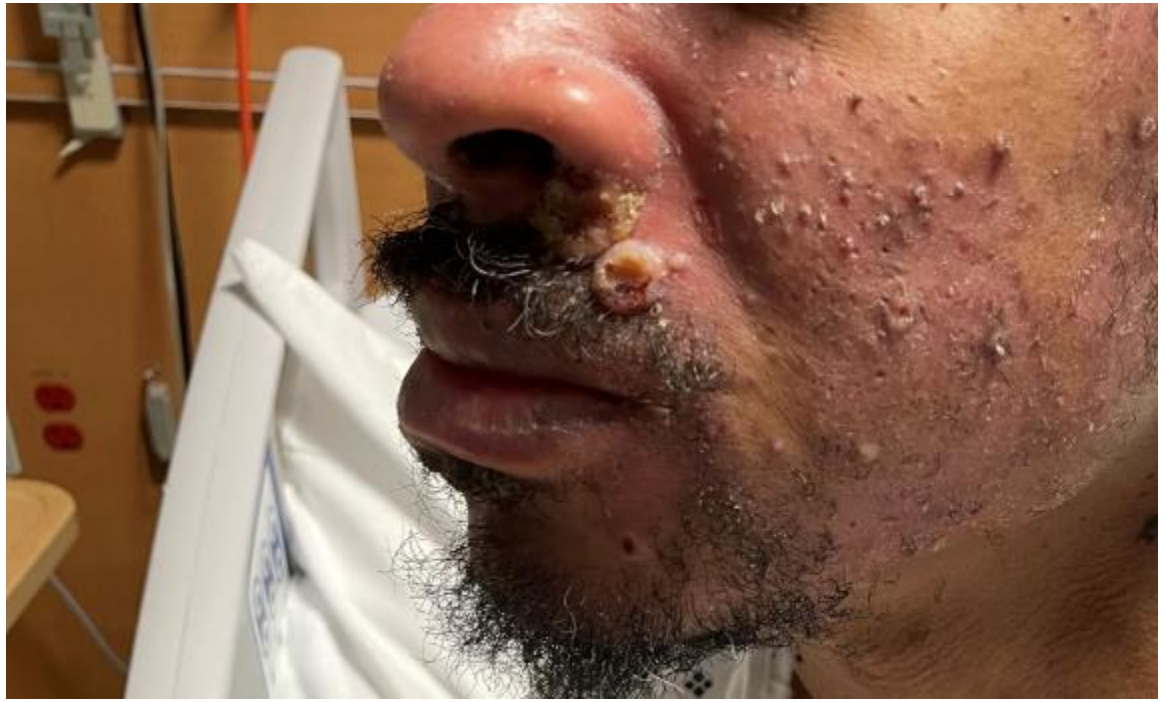


Courtesy Dr David Wheeler

DAY 16





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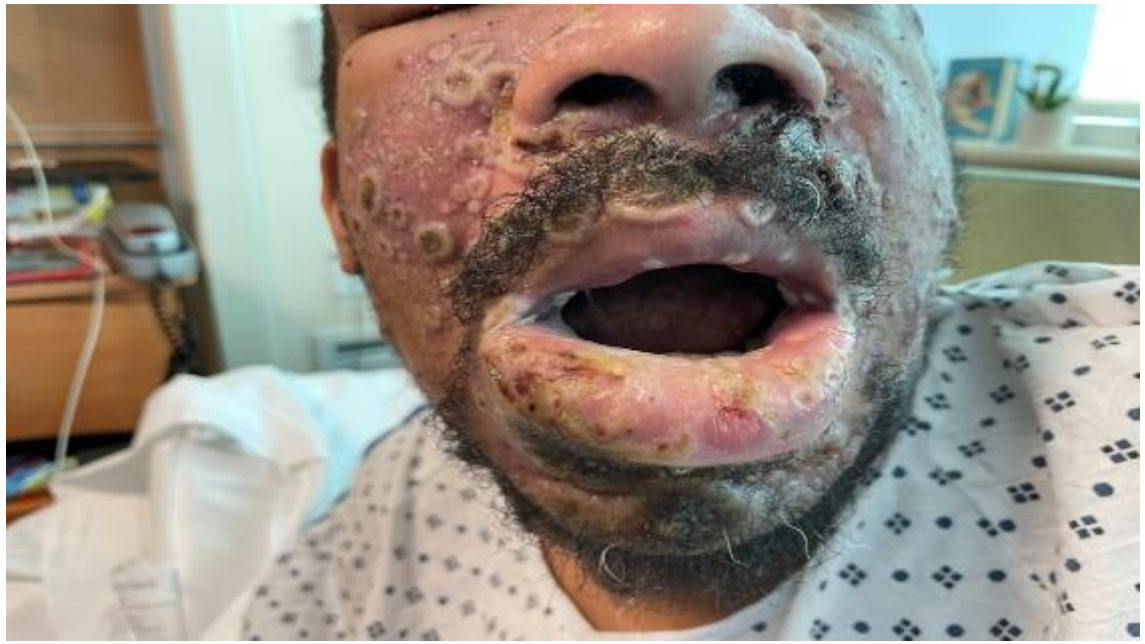
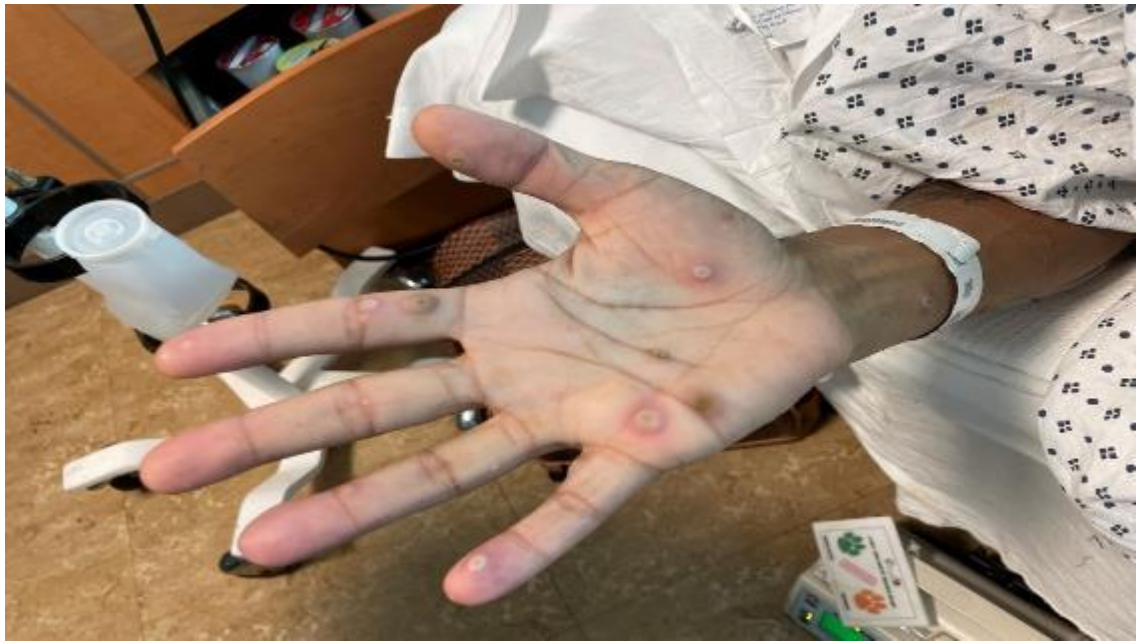
DAY 30 ON TREATMENT





Courtesy Dr David Wheeler

PATIENT WITH ADVANCED HIV AND MPOX

- Initiated IV tecovirimat
  - Urgent delivery from VDH
- Started HIV treatment
- Completed treatment for PCP
- Began evolving new lesions
  - Swelling of mouth, oral lesions
  - Explosion of facial lesions
  - Confluence of peri-anal ulcers

Courtesy Dr David Wheeler

MPOX & HIV INFECTION

- People with HIV-associated immunosuppression or who are not virologically suppressed can be at increased risk of severe mpox disease
- Vaccination with JYNNEOS is considered safe for people with HIV
- Antivirals for mpox have few interactions with antiretroviral therapy (ART)
- TPOXX should be considered in people with HIV, particularly if immunosuppressed
- Addition of other therapeutics (cidofovir, brincidofovir, VIGIV) may be considered for those not improving or progressing

Clinical Considerations for Treatment and Prophylaxis of Mpox Infection in People Who are Immunocompromised

MPOX & HIV INFECTION

- For people with HIV diagnosed coincident with mpox or who are not taking ART, CDC recommends starting ART as soon as possible, and in consultation with an expert in HIV medicine if needed

- STI screening for sexually active persons evaluated for mpox, treat if test positive

- Virologic and Immunologic Characteristics of Severe Mpox in People with Advanced HIV (VIRISMAP) Study to determine why some patients have severe mpox and understand pathogenesis

Clinical Considerations for Treatment and Prophylaxis of Mpox Infection in People Who are Immunocompromised

THANK YOU TO DR DAVID WHEELER!

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