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Ponce De Leon Center

Clinical Presentation and Complications of Mpox in Atlanta During the 2022 Outbreak

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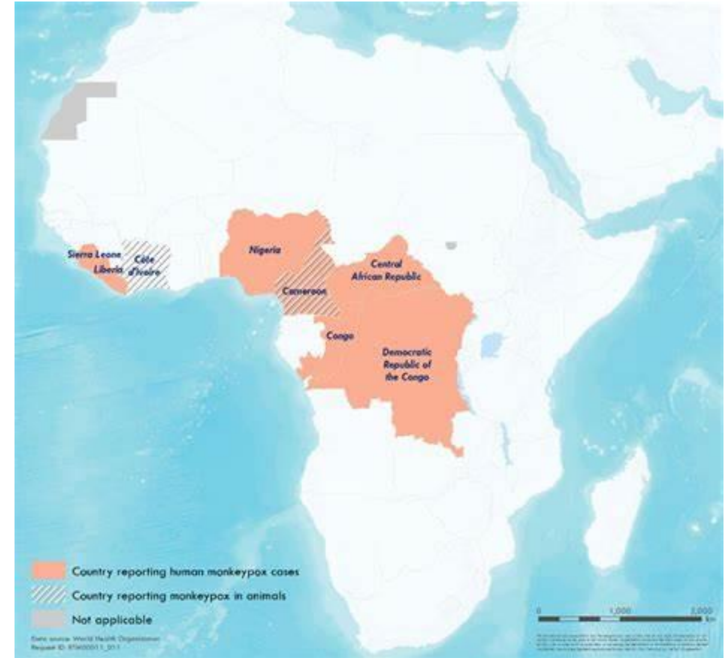
Endemic Mpox

- Clade I (Congo Basin/ Central African)
  - Higher mortality (~ 10%)
- Clade II (West African)
  - Lower mortality (~ 3%)[1]



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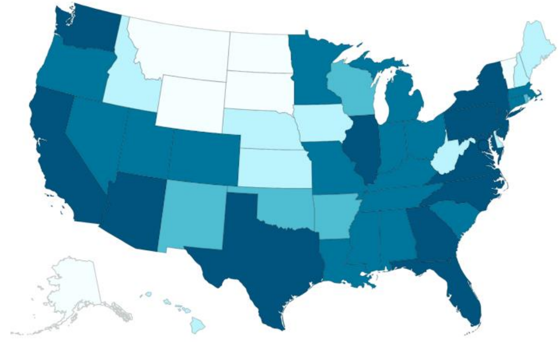
2022 Global Mpox Outbreak

- In spring 2022, clade II monkeypox virus (since renamed “mpox virus”) began spreading in numerous non-endemic regions.
- The global outbreak of mpox starting in 2022 is the largest in history to occur outside the continent of Africa[2,3].
- There have been over 90,000 confirmed global mpox cases involving over 100 non-endemic countries[4].
- Transmission predominantly occurs via sexual and intimate contact.
- Cases disproportionately affected certain groups[5]:
  - Men who have sex with men (MSM): ~ 95% of cases
  - People living with HIV (PLWH) ~ 40% of cases

2022 Mpox Outbreak in the U.S.



- 32,063 cases (as of 1/10/24)
- 58 deaths
- U.S. South was the region with the highest case counts[6]

- Notable population disparities[7]:
  - People living with HIV (PLWH):
    - 0.4% of population; 38% of mpox cases; 94% of deaths
  - Black (Non-Hispanic) individuals:
    - 12.1% of population; 33% of mpox cases; 86% of deaths

Image: https://www.cdc.gov/poxvirus/mpox/response/2022/us-map.html

Atlanta Patient Cohort

- Cohort of all individuals diagnosed with mpox disease at EUH, EUHM, Grady/Ponce, and the Atlanta VA from 6/1/2022- 10/7/2022.
- Medical charts were reviewed in detail to collect data on demographics, exposures, clinical course, management, and outcomes.
- Data collection was a collaborative effort of more than 20 people from the Emory ID Department, Emory Center For AIDS Research (CFAR), and Grady Ponce de Leon Center.

Demographics	
Median age (IQR, years)	35 (30-41)
Gender identity	
• Cisgender man	384 (97.2%)
• Transgender woman	10 (2.5%)
• Cisgender woman	1 (0.3%)
Race	
• Black	335 (84.8%)
• White	18 (4.6%)
• Other/ unknown	42 (10.6%)
Ethnicity	
• Hispanic/Latinx	21 (5.3%)
Sexual practices	
• Sex with cisgender men	342 (86.6%)
Unhoused	30 (7.6%)
Uninsured	229 (58.0%)
HIV-positive	324 (82.0%)

Clinical Presentation

Most Common Presenting Symptoms:	
• Rash	366 (92.7%)
• Fever/ chills	175 (44.3%)
• Lymphadenopathy	144 (36.5%)
• Fatigue/ malaise	120 (30.4%)
• Rectal pain	105 (26.6%)
• Sore throat	91 (23.0%)
• Myalgias	63 (15.9%)
• Headache	32 (8.1%)

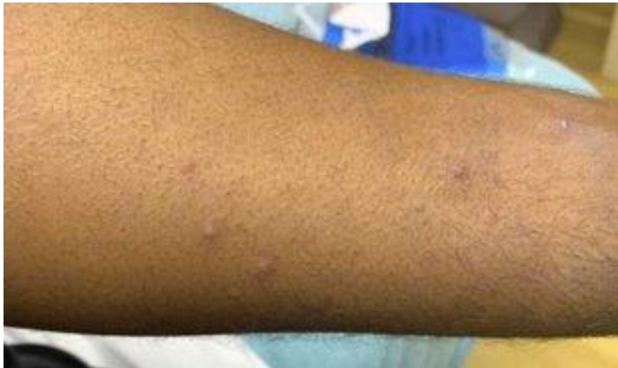
Differences in 2022 outbreak clinical presentation compared to endemic mpox:

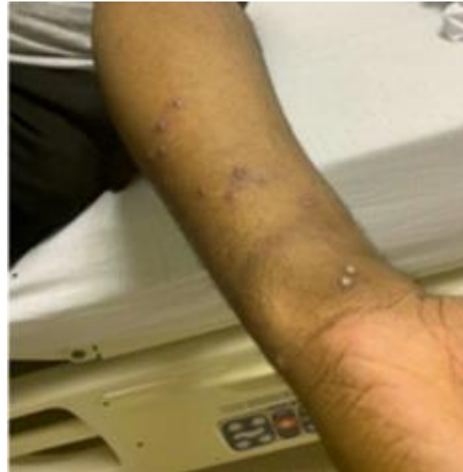
- Less prodromal symptoms
    - Less fevers, chills, lymphadenopathy, myalgias
- Rash generally more mild
    - Fewer lesions
    - More localized
        - Rash may be localized to only skin around the anorectum, genitals, or mouth/ lips (sites of sexual contact)
- More common mucosal involvement of rectum, urethra, and/or oropharynx
- Frequent concomitant chlamydia, syphilis, gonorrhea, and/or HIV diagnoses.

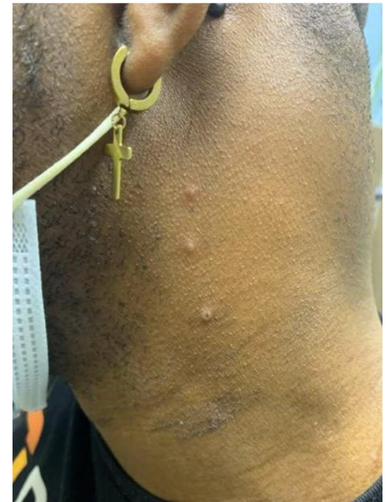
Mucosal Involvement	
• Anorectal	89 (22.5%)
• Oral/ pharyngeal	82 (20.8%)
• Urethral	26 (6.6%)
• Ocular	3 (0.8%)
• Nasal	2 (0.5%)
Number of mucosal sites involved:	
• None	228 (57.7%)
• One site	135 (34.2%)
• Two or more sites	32 (8.1%)

Clinical Presentation: Timing

Median days from symptom onset to mpox testing	5 (IQR: 3-7)
Prior healthcare visit(s) for mpox symptoms without mpox testing	91 (23.0%)







(All clinical images used with patient consent)

Mpox Rash: The 6 P's

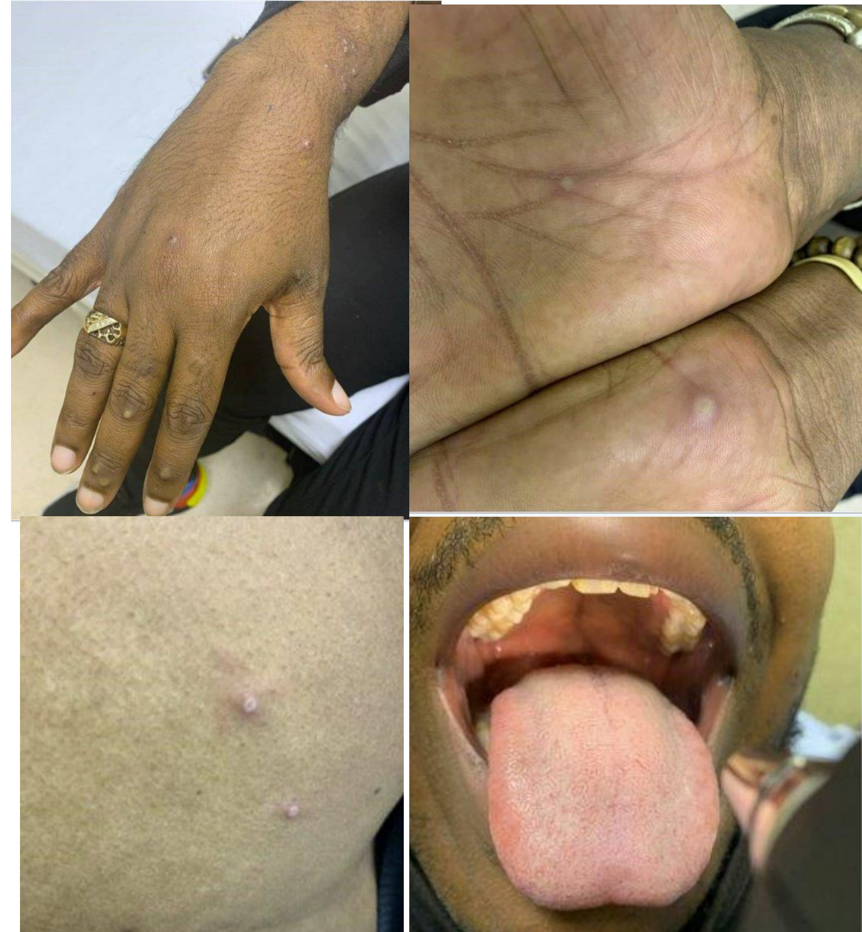
Morphology: Papular → Pustular

Location: Peri-anal (often with Proctitis)

Penis

Pharynx

Periphery (limbs > torso)



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Rash Progression

(Papule → pustule → crust → scab → healing)

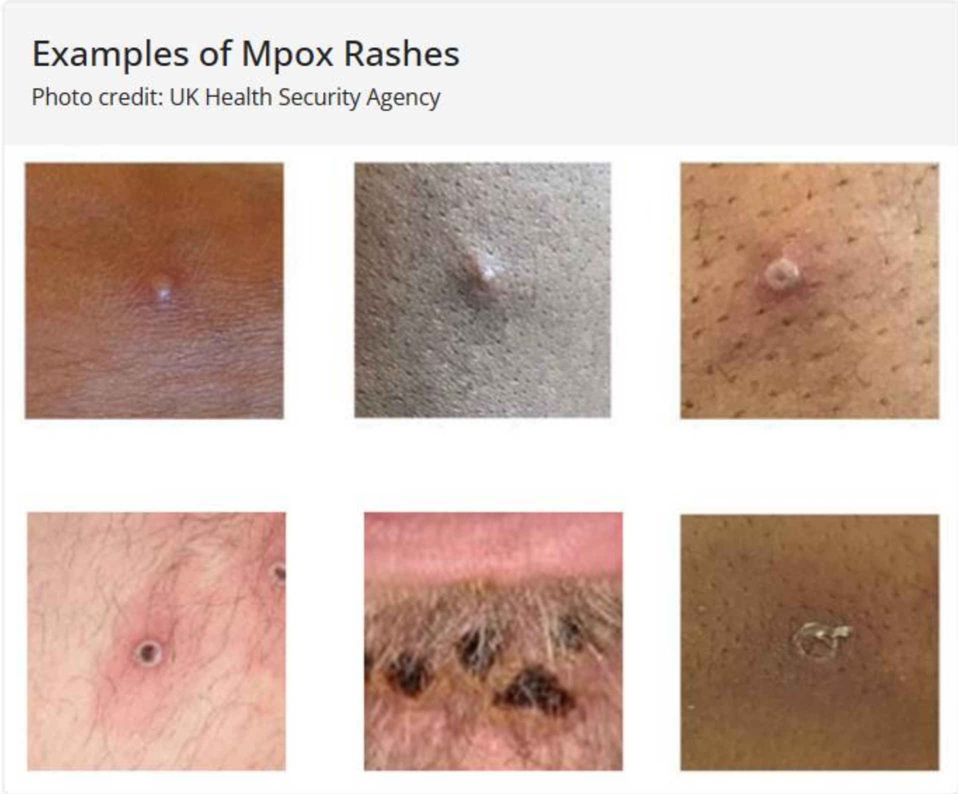


Image: https://www.cdc.gov/poxvirus/mpox/clinicians/clinical-recognition.html

Diagnosis

- Mpox PCR swab
- Technique: Unroof and swab 1-2 skin lesions
  - If no obvious skin lesions, then swab the affected site (e.g. rectal swab, pharyngeal swab)
- Concomitant STI screening
  - GC/CT NAAT throat/ rectum/ urine
  - RPR
  - HIV screen
  - +/- HBV and HCV serologies

Image: https://www.mwe.co.uk/wp-content/uploads/2021/04/Viroult-with-mini-and-standard-swab.png

Complications	
• Any Complication	68 (17.2%)
• Bacterial superinfection (cellulitis/ abscess)	38 (9.6%)
• Anorectal abscess	8 (2.0%)
• Pharyngeal abscess	4 (1.0%)
• Bacteremia	4 (1.0%)
• Colitis/ GI bleeding requiring transfusion	13 (3.3%)
• Delayed rash healing > 4 weeks	10 (2.5%)
• Conjunctivitis	4 (1.0%)
• Phimosis	3 (0.8%)
• Myocarditis	2 (0.5%)

Outcomes

Outcomes	
Hospital Admission	66 (16.7%)
ICU Admission	4 (1.0%)
Death	1 (0.3%)
Recovery	394 (99.7%)

The vast majority of patients recovered without sequelae.

Risk Factors Associated with Severe Disease

- Older age
- Immunocompromised states
  - Non-HIV (e.g. hematologic malignancy, immunosuppressive meds)
  - HIV infection
    - Lower CD4+ count (< 200 cells/ μL)
    - Non-suppressed HIV viral load (> 200 copies/ mL)
- Unhoused status
- Mucosal site involvement at presentation

Management

- Supportive Care
  - Pain management:
    - NSAIDs
    - Topical dibucaine for anorectal irritation
    - Short-course opiates for severe pain (e.g. necrotic skin lesions, mucosal involvement)
  - Antihistamines (e.g. hydroxyzine) for itching
  - Acetaminophen for fever
  - Stool softeners if proctitis
  - Antibiotics if signs of skin lesion bacterial superinfection
  - IV fluids if difficulty with PO fluid intake

Image: https://www.grxstatic.com/d4fuqqd5l3dbz/products/Package_15180.JPG

Management

- Antivirals
  - **Tecovirimat**
    - Efficacy shown in animal models (if started within 5-7 days of mpox inoculation)
    - Favorable safety profile in humans
    - Efficacy in humans has not been conclusively demonstrated
      - A small observational matched-cohort of people with HIV with mpox suggests tecovirimat may be beneficial if started early after symptom onset[8].
    - Access: ACTG STOMP trial (www.stomptpoxx.org) - RCT of tecovirimat vs placebo
    - Conclusion: Offer STOMP enrollment to any patient with suspected or confirmed mpox.
  - **Cidofovir/ Brincidofovir and Vaccinia Immune Globulin (VIGIV)**
    - IV-only; case reports of use as salvage therapy in severe cases.

Management: Refractory Disease

- Some people with very advanced HIV (CD4+ < 100 cells/μL) develop non-healing necrotic skin lesions that may take months to recover.
  - Requires aggressive supportive care: wound care, pain management, treatment of bacterial superinfections, etc.
  - In our Atlanta cohort, 3 patients (0.8%) had hospital LOS ≥ 30 days.
- Restarting antiretroviral therapy (ART)
  - In general, prompt reinitiation of ART is recommended.
  - A large global case series including individuals with mpox and advanced HIV raised c/f an immune reconstitution inflammatory syndrome (IRIS) phenomenon which can paradoxically exacerbate disease severity[9].
    - It may be appropriate to delay ART initiation in mpox patients who are critically ill.
    - In our Atlanta cohort, of the 9 patients with CD4+ < 100 cells/μL who were non-adherent to ART prior to presentation and were promptly restarted on ART, no paradoxical worsening of mpox disease or IRIS-like phenomenon was observed.

Prevention

What: JYNNEOS vaccine

Who: Any cigender man or transgender female who is sexually active with > 1 male partners within the past 6 months. Other high-risk individuals can be vaccinated on a case-by-case basis (see www.cdc.gov/poxvirus/mpox/vaccines).

When: 2 doses, given 4 weeks apart.

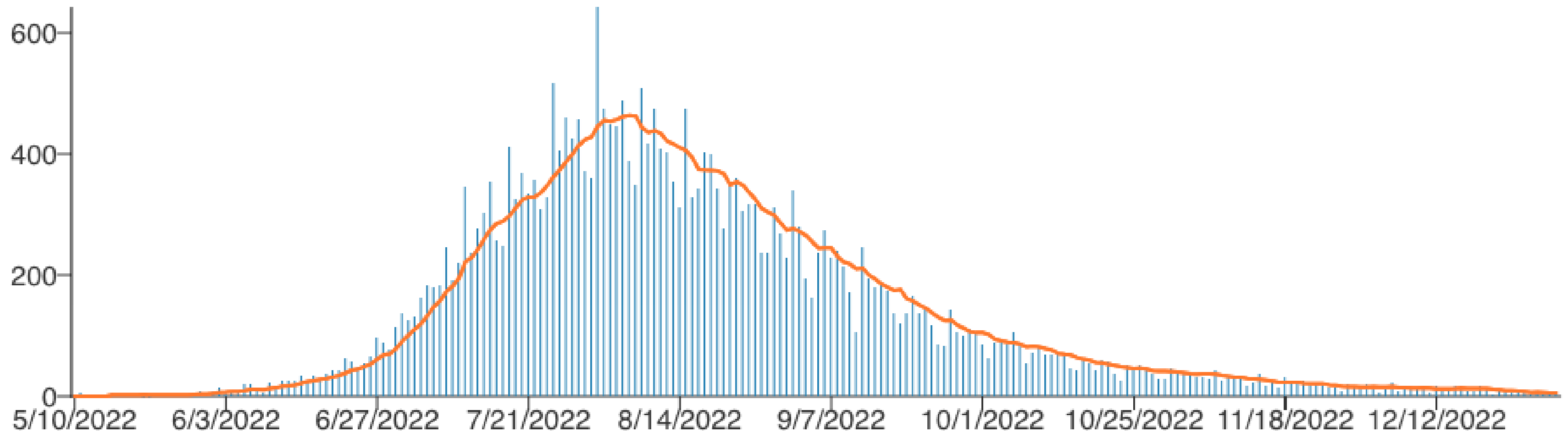
Where: Intradermal administration

Why: > 65% effective at preventing mpox[10]

Image: https://media.cnn.com/api/v1/images/stellar/prod/220906134007-01-jynneos-monkeypox-vaccine.jpg?c=16x9&q=h_833,w_1480,c_fill

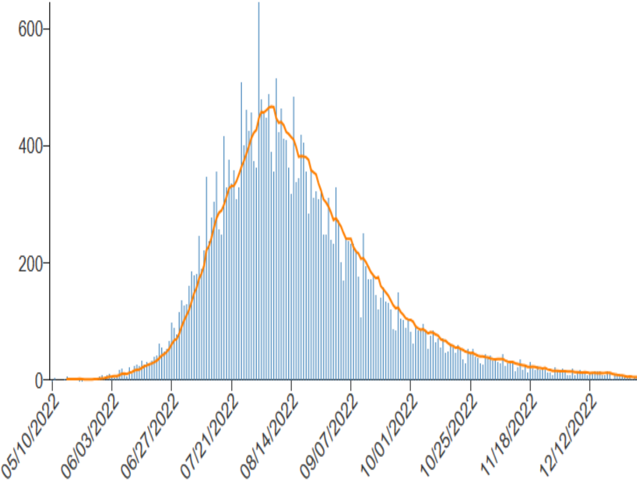
Ending the Outbreak

- Likely predominantly due to high vaccine uptake in high-risk populations[11].

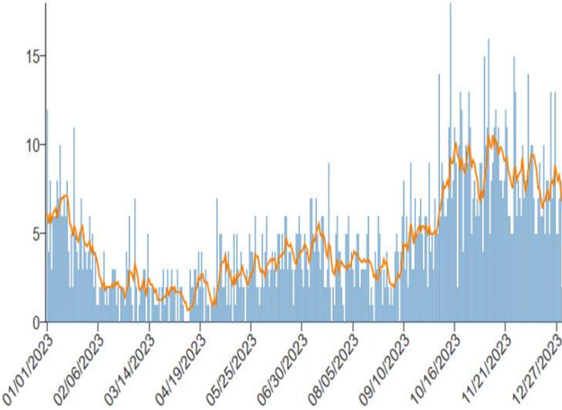


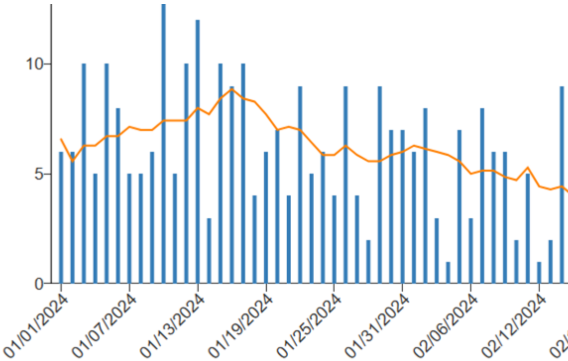
Mpox: USA 2024

- While case numbers are quite low, they have not gone to zero[6].



2022





2023

2024

Endemic Mpox: 2024

- The largest clade I mpox outbreak in the history of the DRC has been ongoing since 2023, with 12,569 suspect mpox cases and 581 deaths[12].
  - Travel-associated cases in the U.S. are possibile and clinicians must remain vigilant.

Image: https://th.bing.com/th/id/R.5e8e866f9892ec505fe7fca70f00c702?rik=V%2fIfvO%2bhwyQSog&riu=http%3a%2f%2fd2z7bzwflv7old.cloudfront.net%2fcdn_image%2fexW_1200%2fimages%2fmaps%2fen%2fcg%2fcg-area.gif&ehk=pwpHurGjqhnQO3uwkM%2beyvHty4Hc4NFEWtwR3wBDEvQ%3d&risl=&pid=ImgRaw&r=0

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Key Takeaways