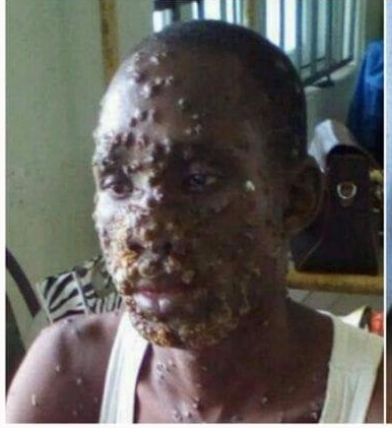
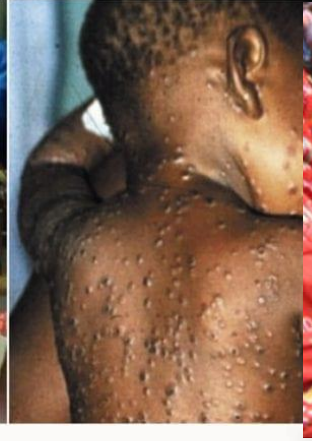
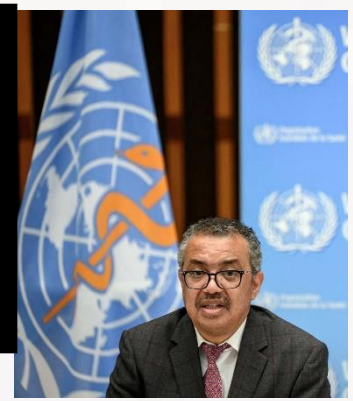




Mpox and HIV

Jeremy Nel, University of Witwatersrand and Helen Joseph Hospital
Lucille Blumberg, NICD and Universities of Pretoria and Stellenbosch

- 14 August 2024 : WHO Director-General declared **mpox** a Public Health Emergency of International Concern (PHEIC) to respond to the increase in cases and multi -country spread of mpox from the Democratic Republic of Congo



Home / World News / WHO calls emergency meeting over surge in mpox cases spreading from Congo

WHO calls emergency meeting over surge in mpox cases spreading from Congo

"The committee will meet as soon as possible and will be made up of independent experts from a range of relevant disciplines from around the world," Tedros posted on X

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The Cases Of Mpox Have Surged In The Central African Nation Since Last September. A Strain Of The Virus Has Now Been Detected In Its Neighbouring Countries (Photo: Reuters)

ANI | Asia

2 min read Last Updated : Aug 08 2024 | 2:51 PM IST

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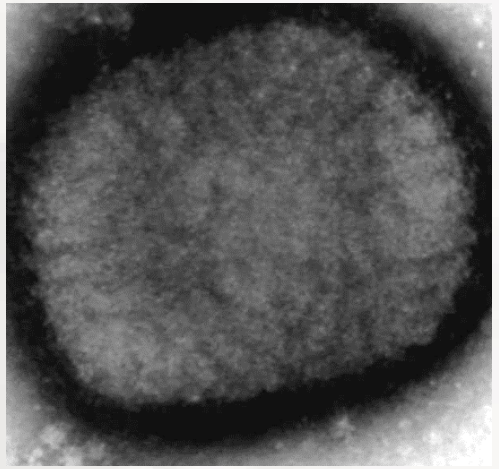
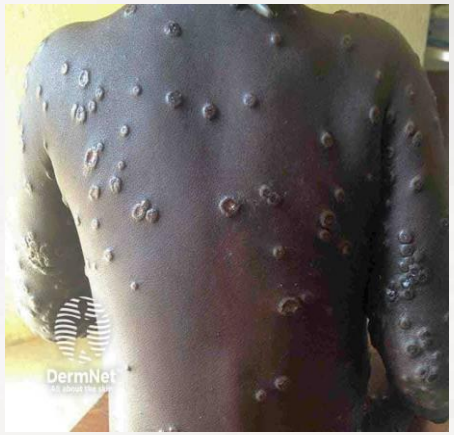
Sept 2025 WHO: PHEIC rescinded Africa CDC retained Mpox as Public Health Emergency of Continental Security

I. What is mpox?

- **Mpox is caused by *Orthopoxvirus monkeypox (MPXV)* (ICTV: 2023), a member of the *Orthopoxvirus* genus in the family *Poxviridae*.**
- Causes mild to severe rash in people, and may be life threatening in immunocompromised or young children.
- Emerging viral infection first reported in 1970, but causing outbreaks classified as Public Health Emergency of International Concern (PHEIC) since 2022
- Depending on the MPXV variant: zoonotic and/or human-to-human transmission.

Electron micrograph of orthopoxvirus particle
Dr Monica Birkhead, NICD





Images from DermNet:
https://dermnetnz.org/

- **Zoonotic transmission**: X

  1970-1986: 245 of 338 cases with zoonotic link, 93 possible human-to-human transmission.

  Close contact with infected animals / Bites, scratches, bush meat preparation (in adequately cooked meat; slaughtering; animal derived products), contact with contaminated materials.

  True host/reservoir still unknown.

  Have been isolated from rope squirrel, mangabey. Also other mammals including tree squirrels, Gambian pouched rats, dormice, other non-human primates.

- **Person-to-person transmission**:

  Close contact (prolonged face-to-face contact, kissing, sexual contact).

  Contact with materials contaminated with virus (via scabs, lesion fluid, for example contaminated linen/clothes).

  Large droplet transmission is possible. Virus enters the body through broken skin, respiratory tract, or the mucous membranes (eyes, nose, or mouth).

  Household outbreaks, up to 7 transmissions in chain[1]

  Secondary attack rate, approx. 10% in smallpox unvaccinated individuals.

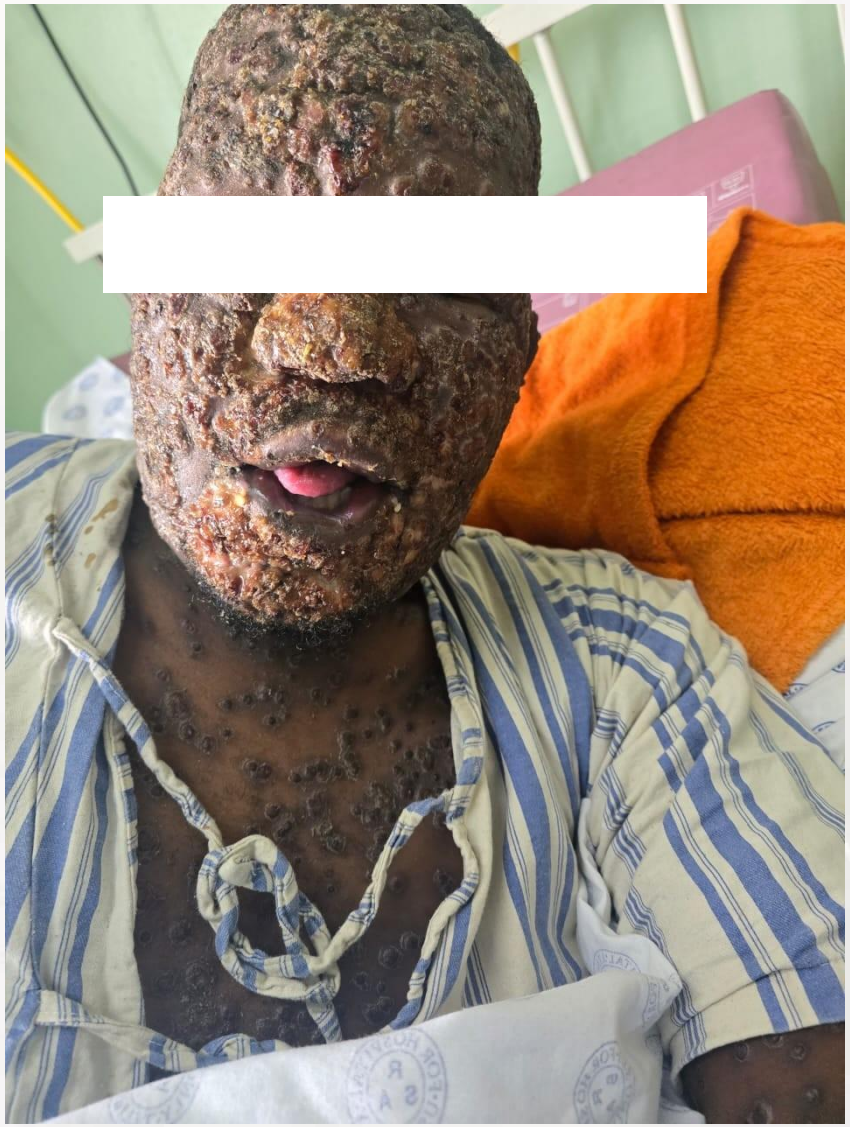
Source of images: Wikipedia

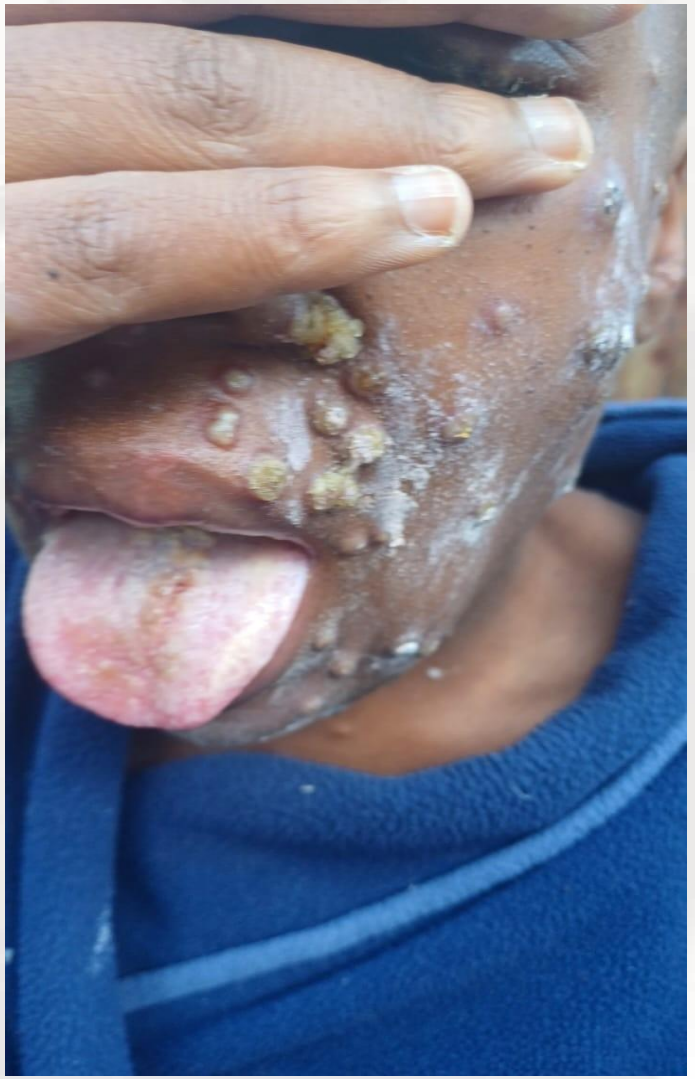
[1] **Nolen et al.** Extended human-to-human transmission during a monkeypox outbreak in the Democratic Republic of the Congo.*Emerg Infect Dis.* 2016; **22**: 1014-1021

- 35 years male, MSM
- Fever, sore throat, night sweats, myalgia, fatigue
- 1 week later- painless , pruritic skin lesions 2-15mm on hand, then genital lesion
- 10 days later –extensive painful lesions
- HIV +, Swab lesion : MPOX Clade 11b
- Rx- isolation, contact tracing, analgesia, ARV
- Tecovirimat x 2/52

SAMJ 2024 Permission granted by patient

Mpox Clade 1b





Mpox in South Africa

- Ongoing reintroductions, with and without transient local transmission noted:

2022: 5 laboratory confirmed cases, no travel histories, ex GP and WC, Clade IIb B.1.7

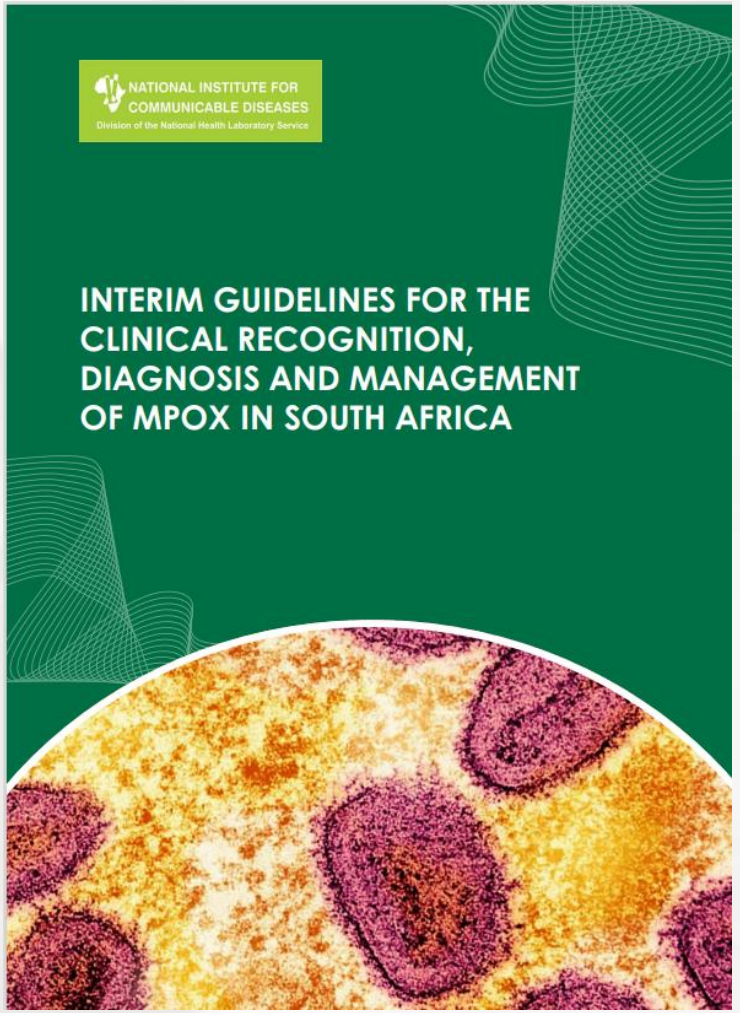
2023: no cases detected

2024: 25 cases confirmed, 1 with travel history (ex Peru, Clade IIb B.1.6), other no travel history (Clade IIb B.1.20, now F2), after August 2024 no further cases detected, ex KZN/GP/WC (three deaths)

2025: Since Feb, 11 cases laboratory confirmed cases, 9 Clade Ib and 2 Clade Iib (sublineage F2)

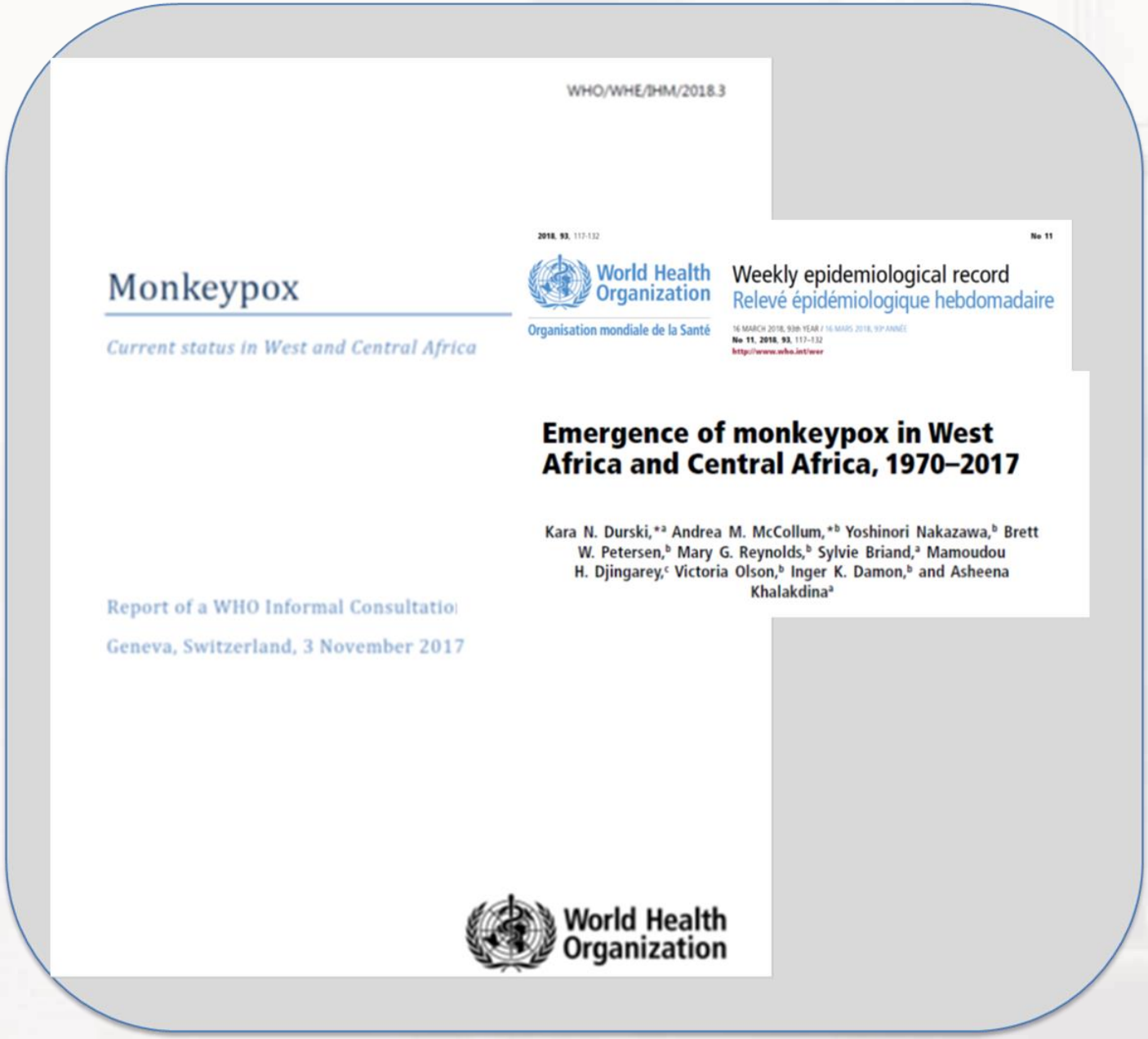
- Interim guidelines for mpox in South Africa available from NICD website: https://www.nicd.ac.za/key-reference-documents/

- 1st vaccination roll out in July 2025, see https://www.gov.za/news/media-statements/health-rolls-out-mpox-vaccination-new-cases-are-detected-16-jul-2025



	CLADE I		CLADE II		
	Clade Ia	**Clade Ib**	**Clade IIa**	**Clade IIb (Lineage A)**	**Clade IIb (Lineage B.1)**
Geographic location	Central Africa	DRC and beyond	West Africa and exotic pet trade outbreak in US (2003)	Nigeria	Multi-country outbreak
Transmission dynamics	Approx. 60-75 % zoonotic Approx. 5-40% human-to-human	100% human-to-human Sexual contact as NB mechanism Close contact	100% zoonotic (no data available from endemic countries, based on US exotic pet trade outbreak)	Transmission mode unknown (61.8%), human-to-human (30%) suspected zoonotic (8.2%) (2017-2019 from Nigeria)	100% human-to-human Sexual contact as NB mechanism Close contact
Animal reservoir	Unknown	NA	Unknown	Unknown	NA
Demographics	90% in < 15 y	85% in adults in DRC 50% in adults in Burundi	70 % adults	80% adults, 70% males	99% adults, 98% males
Rash characteristics	Mostly centrifugal, often on face (>80%) >100 lesions	Mixed (often with oral, genital or anogenital lesions)	Mostly centrifugal from point of animal contact	Mixed (centrifugal), genital lesions in 60-85%	Many anogenital, localized
Mortality	5-10% mostly children (less with improved clinical care?)	0.7 %	0%	3-5% in young adults with advanced HIV	0.2%

Adapted from presentation by L Subissi, WHO, September 2024
Full references in notes section

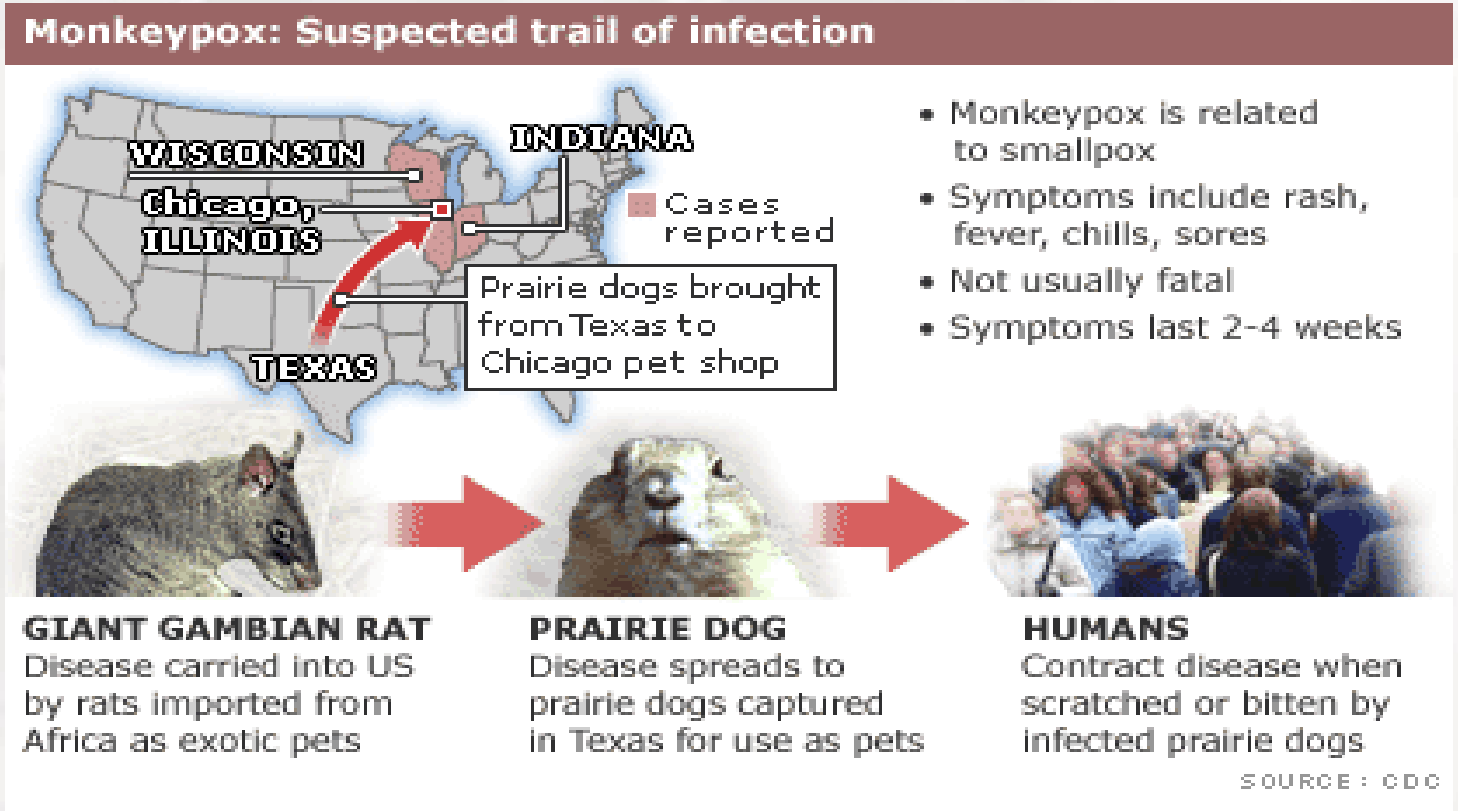

WHO/WHE/IHM/2018.3
Monkeypox
Current status in West and Central Africa
Report of a WHO Informal Consultatio
Geneva, Switzerland, 3 November 2017
World Health Organization
2018, 93, 117-132
No 11
World Health Organization
Organisation mondiale de la Santé
Weekly epidemiological record
Relevé épidémiologique hebdomadaire
16 MARCH 2018, 93th YEAR / 16 MARS 2018, 93e ANNÉE
No 11, 2018, 93, 117–132
http://www.who.int/wer
Emergence of monkeypox in West Africa and Central Africa, 1970–2017
Kara N. Durski,*[a] Andrea M. McCollum,*[b] Yoshinori Nakazawa,[b] Brett W. Petersen,[b] Mary G. Reynolds,[b] Sylvie Briand,[a] Mamoudou H. Djingarey,[c] Victoria Olson,[b] Inger K. Damon,[b] and Asheena Khalakdina[a]

- **USA, 2003**: 72 reported cases (37 lab confirmed, 100% recovery) of mpox diagnosed from different locations in the US Midwest. No human to human transmission noted.

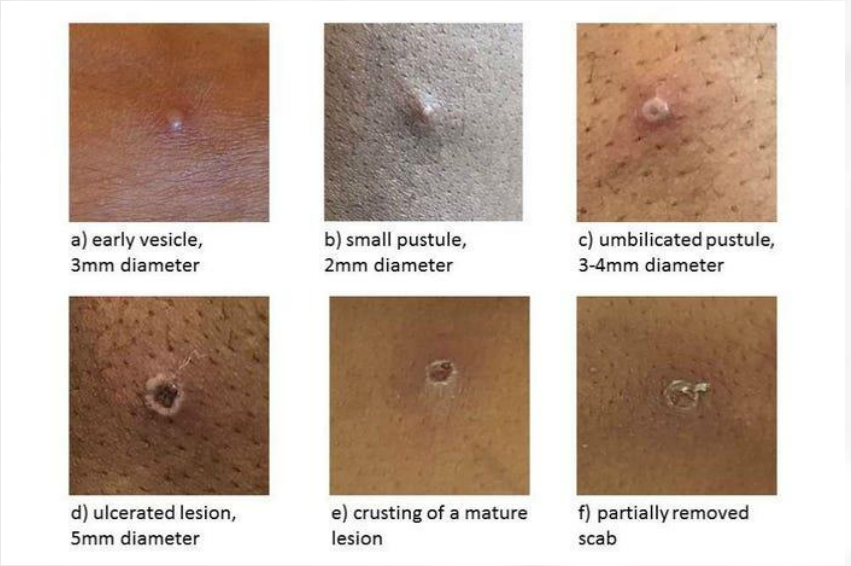
First report of human mpox outside of Africa.

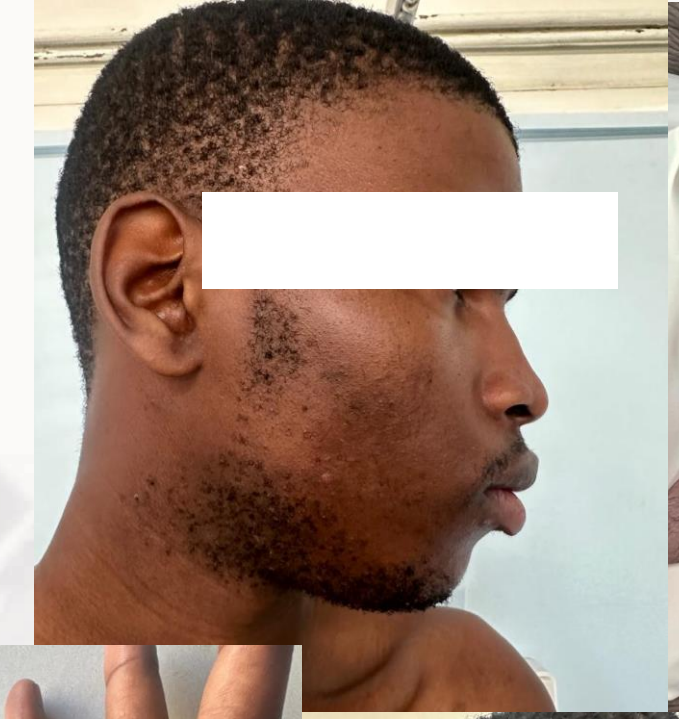
Linked to exotic pet trade and involved prairie dogs which was co-housed with several other animals that originated from Ghana, including: rope squirrels (*Funiscuirus* sp.), tree squirrels (*Heliosciurus* sp.), Gambian giant rats (*Cricetomys* sp.), brushtail porcupines (*Atherurus* sp.), dormice (*Graphiurus* sp.), and striped mice (*Hybomys* sp).

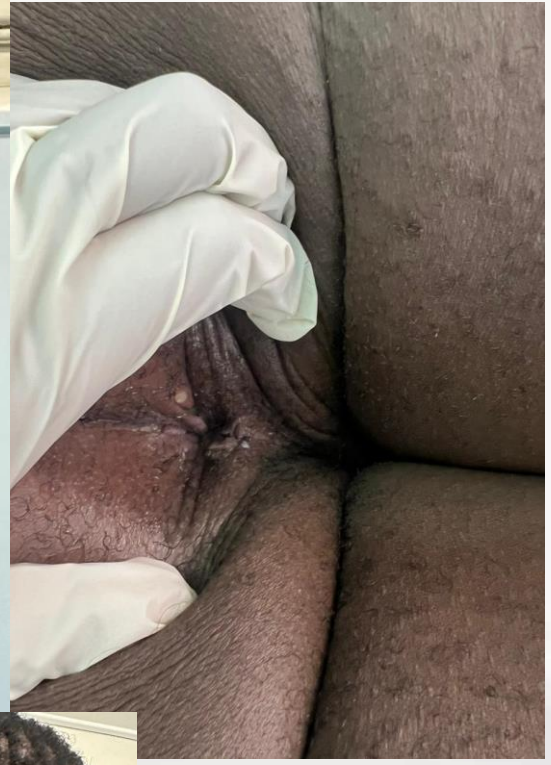
Prairie dog

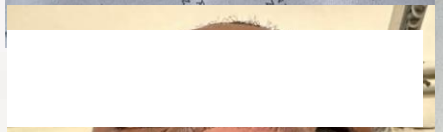


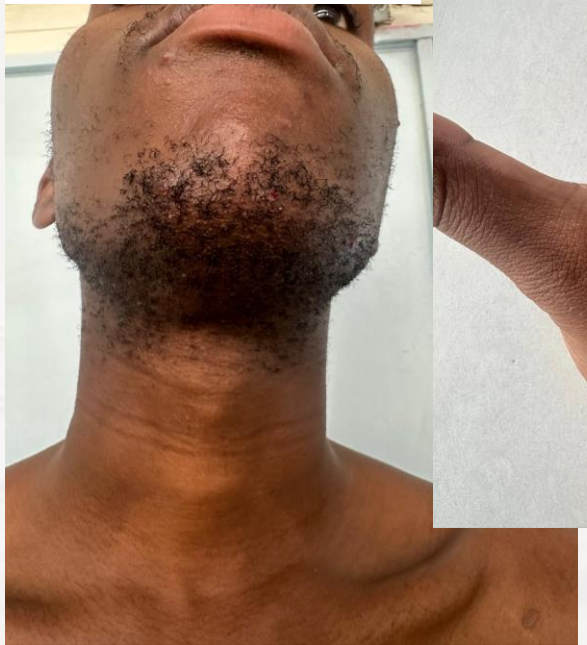
- Incubation period- 3-17 days
  Fever/prodrome
  Lymphadenopathy
- Rash – blistering, umbilicated, crust
- May be painful, NOT itchy
- Few to 100s of lesions
- Face, limbs, trunk, ano- genital, oral

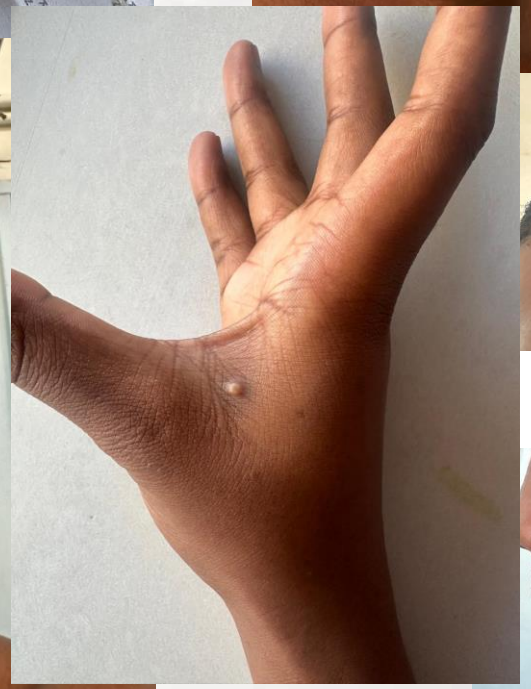


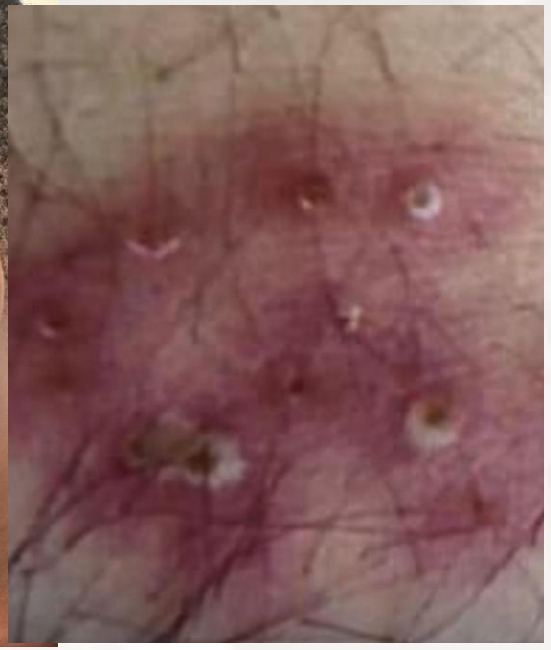


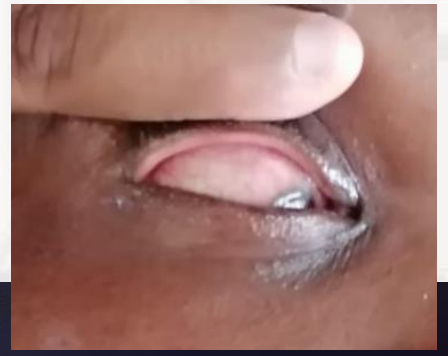


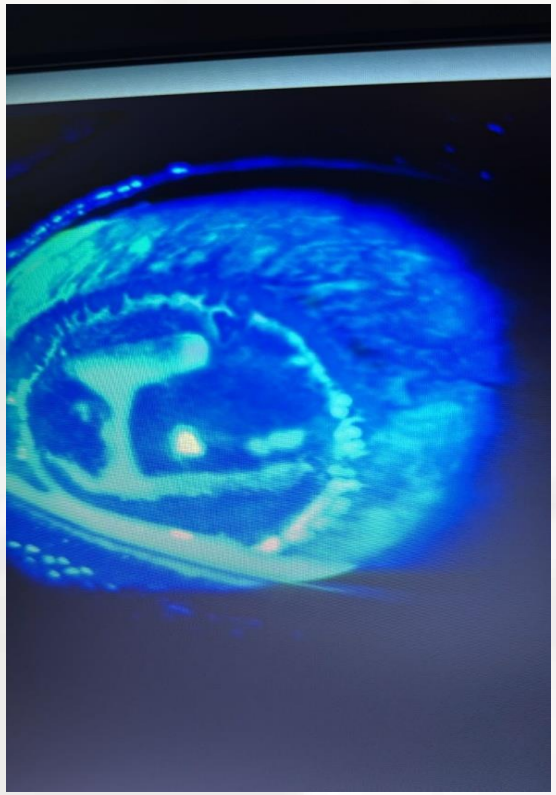


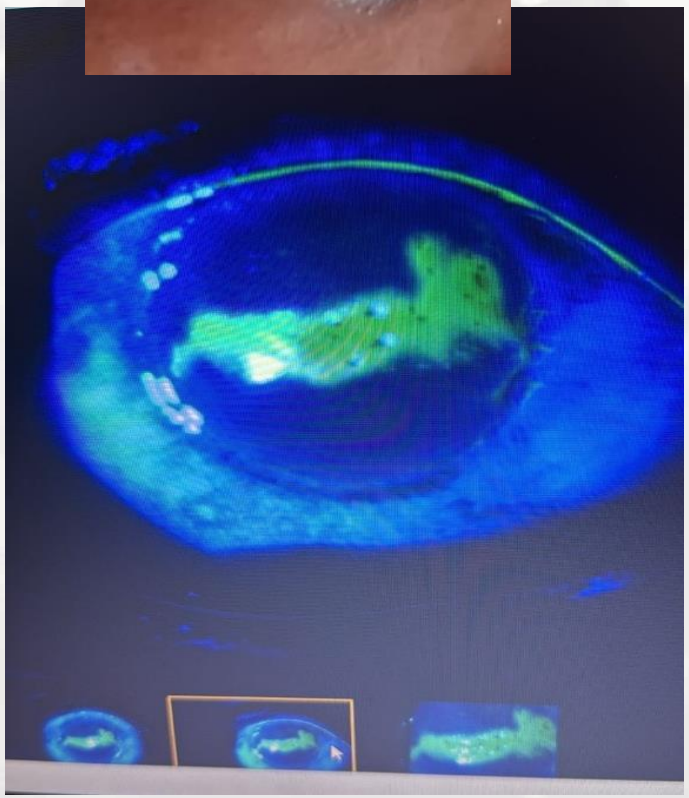




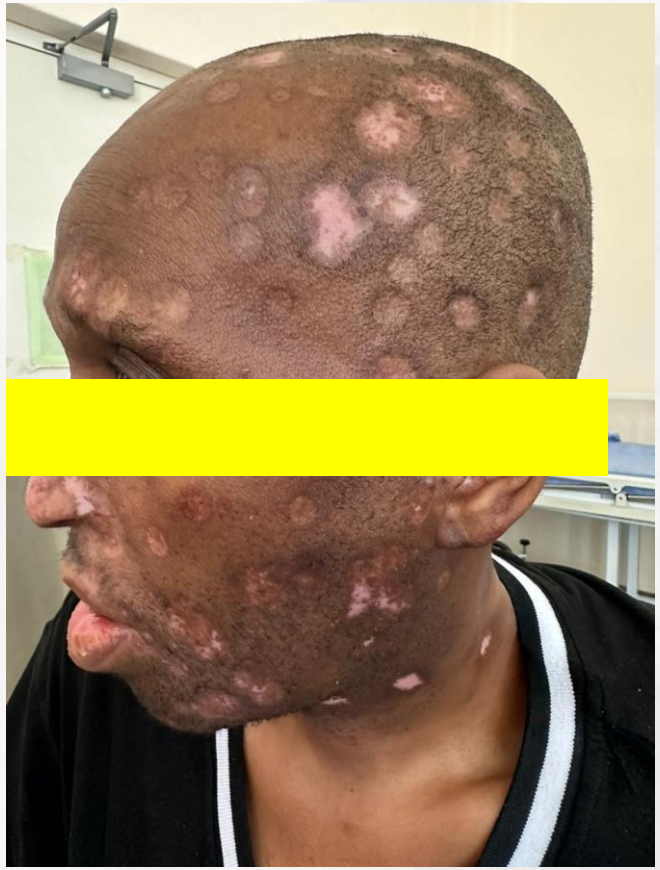


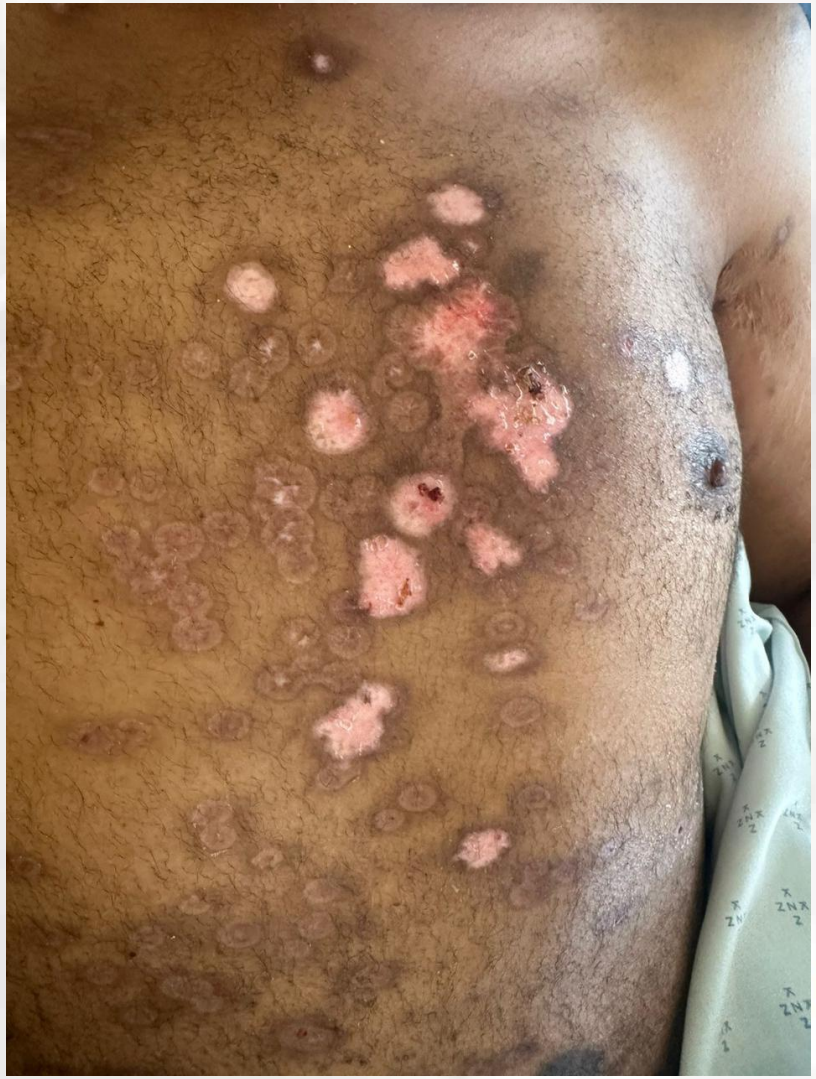




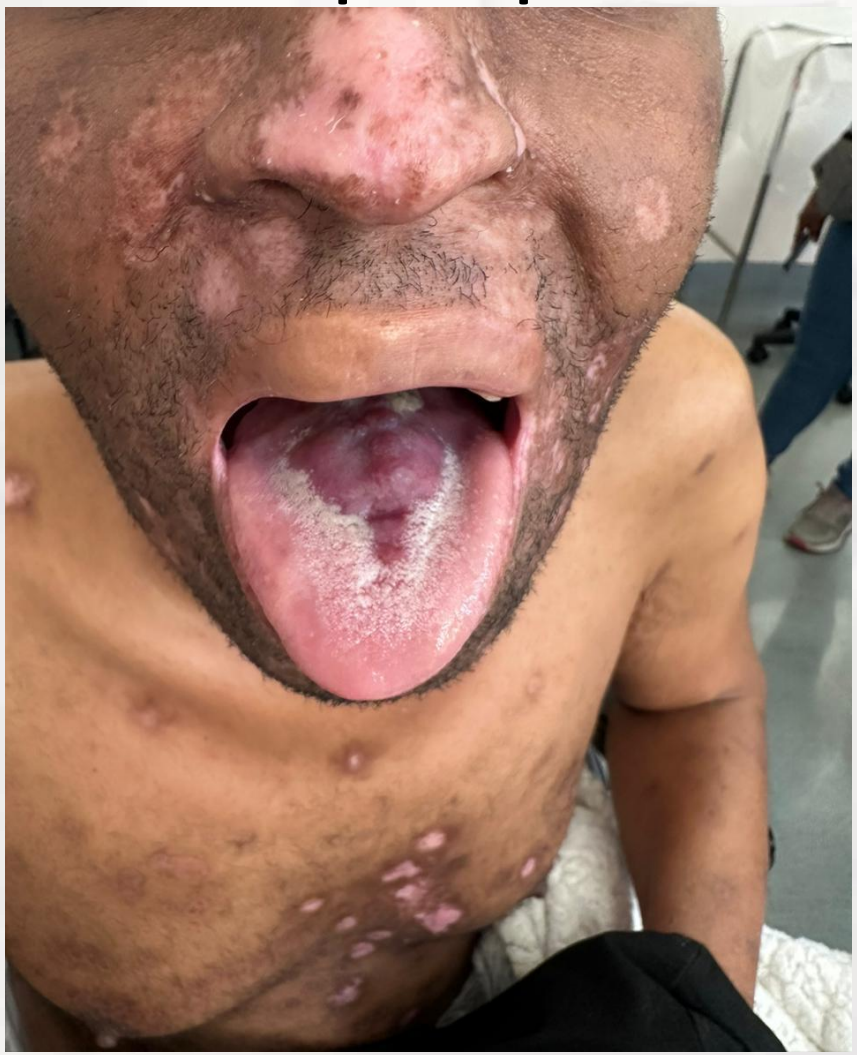


Post mpox scarring

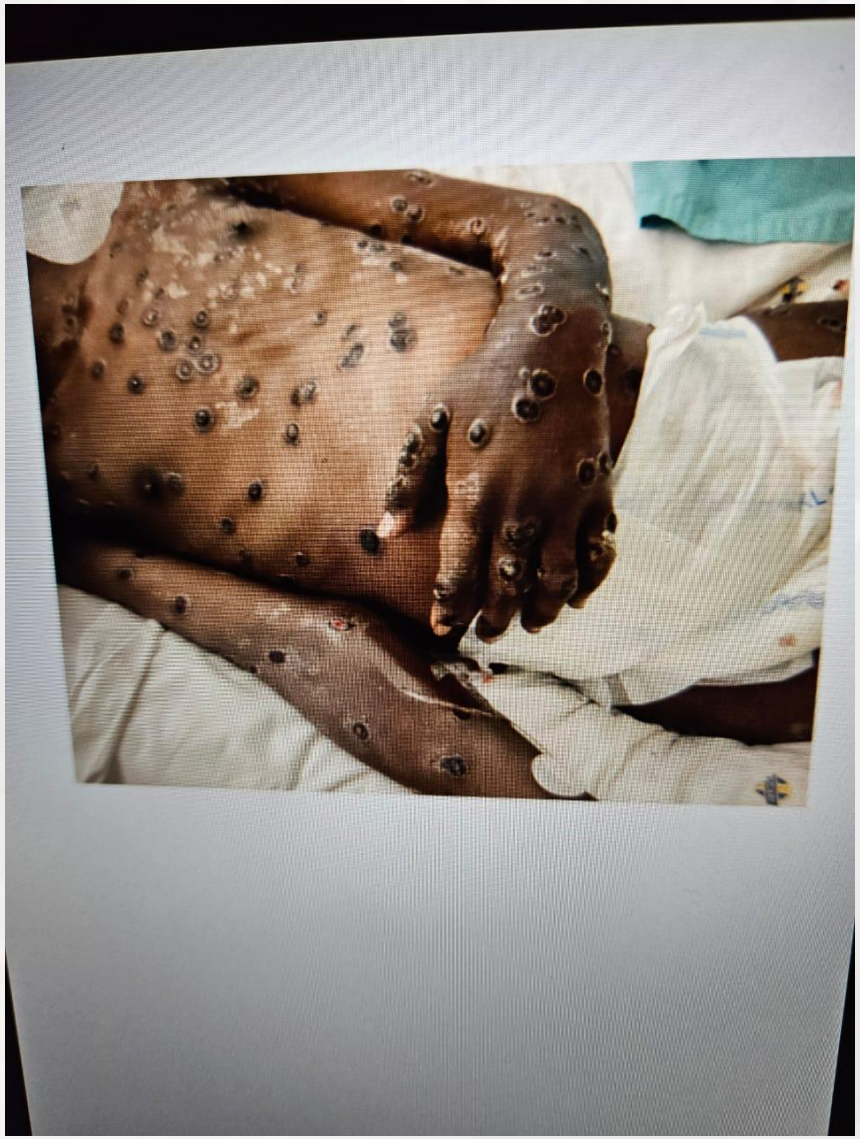




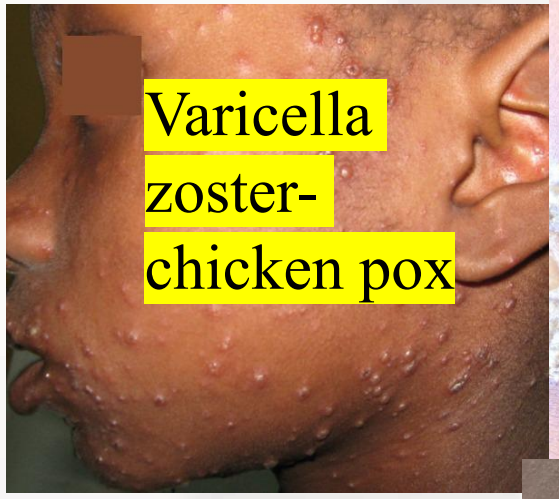
Mpox plus KS

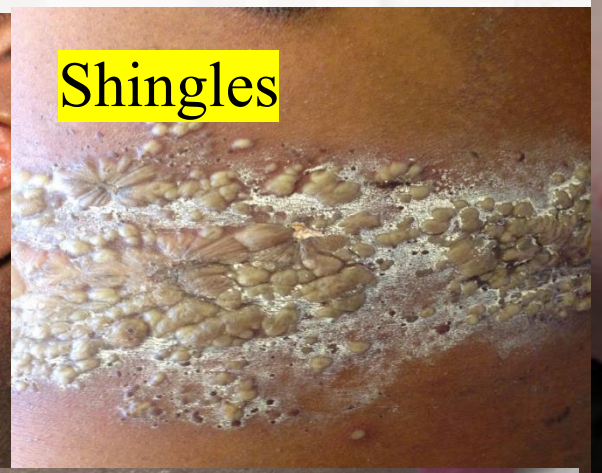


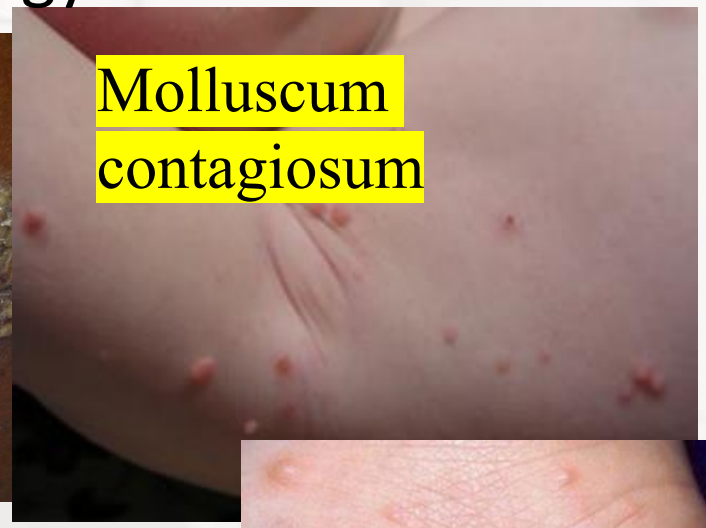
Fatal mpox case, advanced HIV, misdiagnosed as deep fungal infection

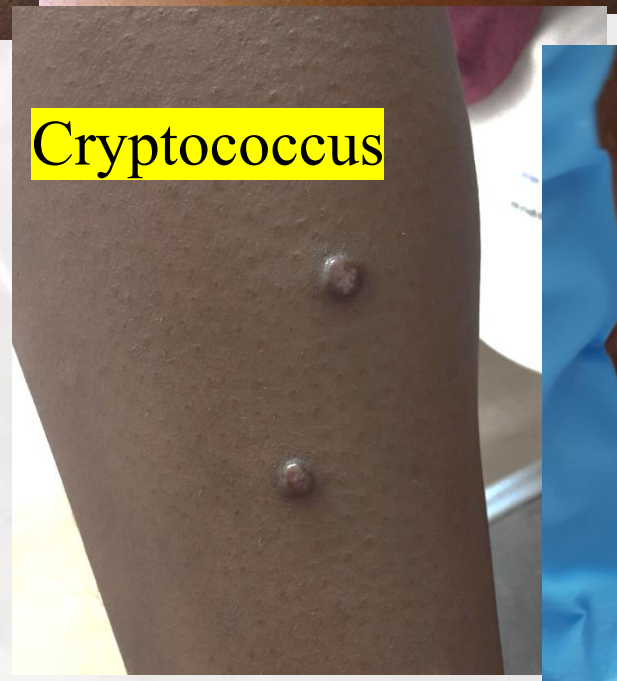


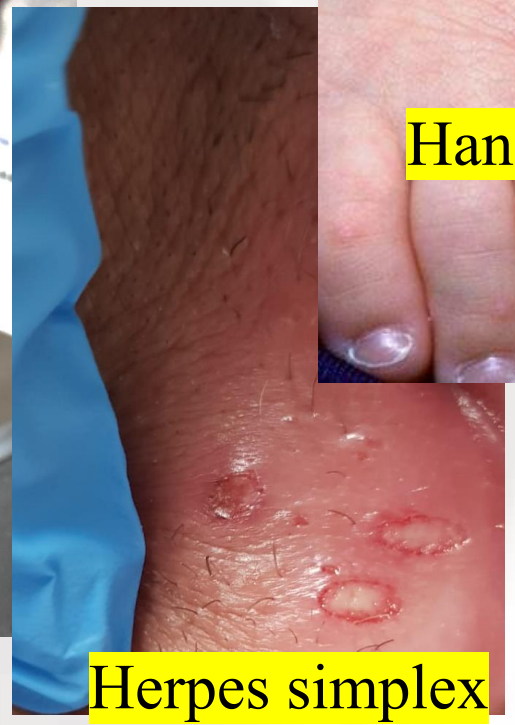
Differential diagnosis : consider rash characteristics + epidemiology



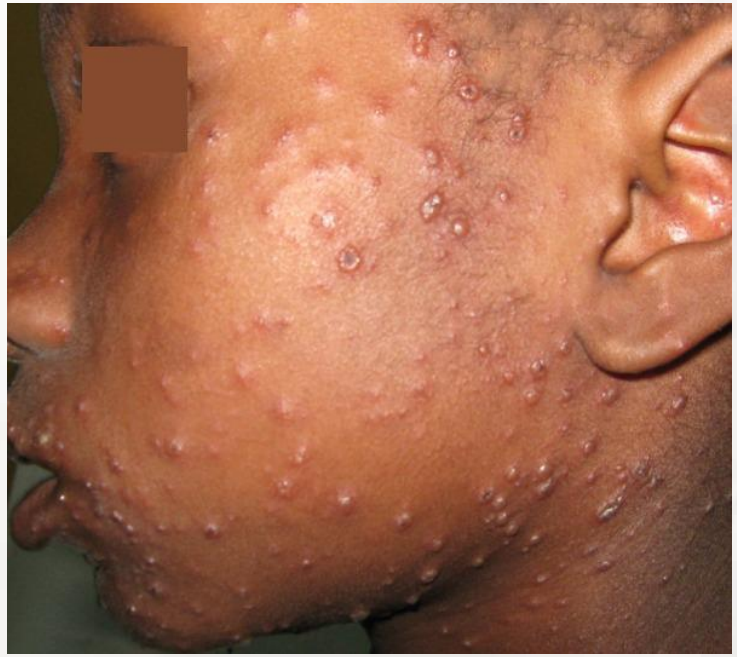


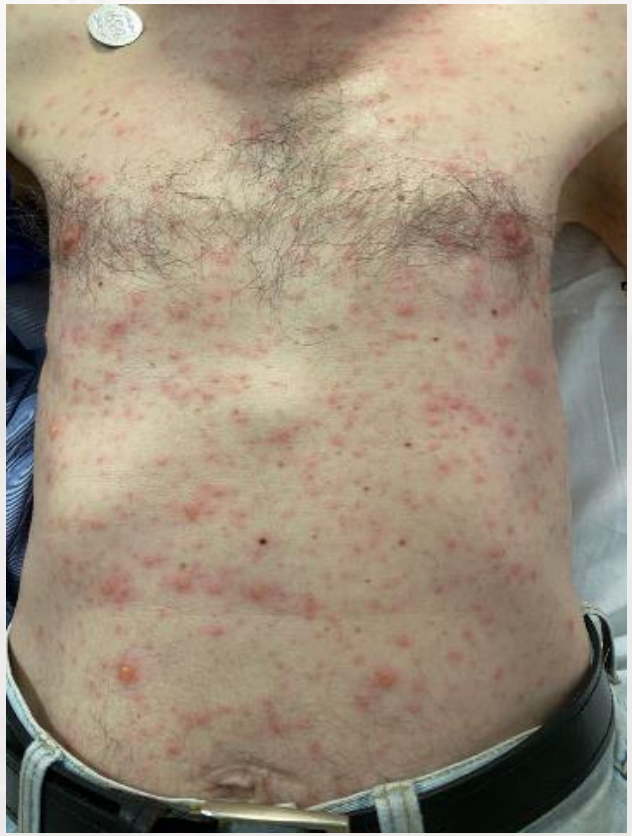






Varicella zoster: chickenpox





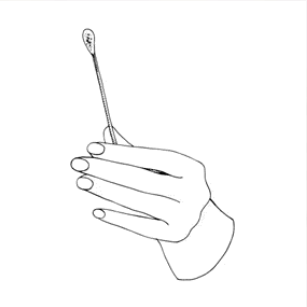
Prodrome of fever and malaise. Itchy papules that become vesicular and sometimes pustular. Lesions at different stages
Begins on face usually, then spreads to trunk

Rx with acyclovir in adults – complications in immune and suppressed adults. NB pneumonia

Mpox in South Africa

- Mpox is a category I notifiable medical condition in South Africa via electronic notification system, see www.nicd.ac.za
- Laboratory testing for suspected cases of mpox is available via NICD and private pathology laboratories
- Guidance for sample collection is available from www.nicd.ac.za

Specimen type	Collection materials	Comments
Skin lesion material: Swabs of lesion exudate Roofs Lesion crust	Dacron or polyester flocked swabs with VTM or dry swab	Required for all investigations
Throat swab	Dacron or polyester flocked swabs with VTM or dry swab	Optional
Rectal and or genital swabs (if lesions present)	Dacron or polyester flocked swabs with VTM or dry swab	Optional
Semen	Urine specimen jar	Optional
Plasma	EDTA collection tube (purple top)	Optional
Serum	Serum separator tubes or clotted blood	Optional



- **Package of care in LMIC:** analgesia, nutritional support, fluids, treatment of secondary infections, skin care, home/hospital isolation
- **Link diagnosis, treatment and prevention to HIV programmes :** manage HIV -related opportunistic infections, STI's
- **Infection prevention control**
- **Psychosocial considerations:** stigma, contact tracing challenges
- **Public health response**

SAMJ 2024; WHO guidelines; NIH STOMP 2024, PALM007 2025; www.nicd.ac.za

- Established an mpox hotline for review of all suspected cases- 24/7
- ID specialists, dermatologists, medical officers

HIV AND MPOX

Worse if CD4 <350.

- Case series (Lancet 2023; 939-49): 382 cases
- Median CD4 211; ½ with suppressed viral load.
- Severe complications more common if CD4 <100 vs CD4 >300:
  - Necrotising skin lesions (54% vs 7%), lung involvement (28% vs 0%), secondary infections/sepsis (44% vs 9%)
  - ¼ hospitalised, of whom ¼ died (all deaths had CD4 <200, and more likely if high VL)

Always check HIV in anyone who you think has mpox!

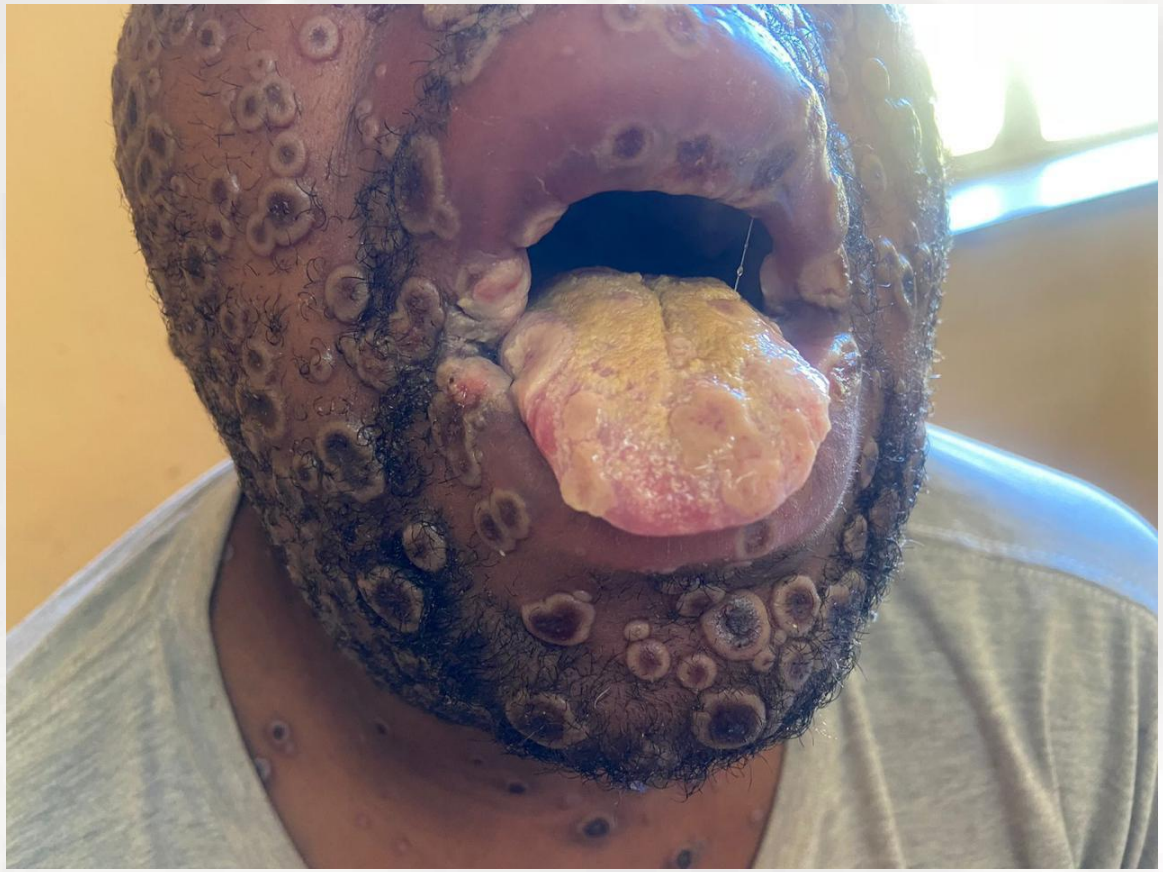
HIV and timing of ART

- No good direct evidence on the timing.
- **But** immunological control is the best way of treating mpox.

- Therefore, **start ARVs as soon as possible** (certainly with 7 days).
  - WHO guidance

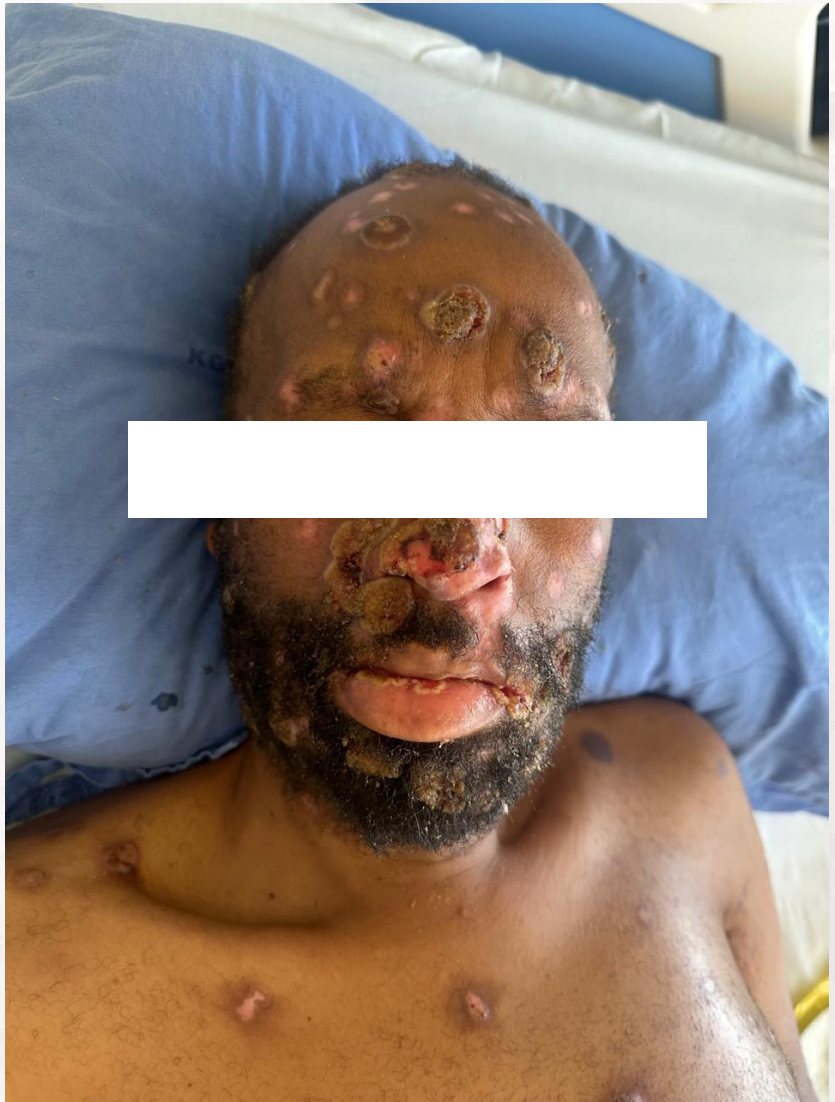
- IRIS risk not well established, but **benefits of early ART initiation likely outweigh any risks**.

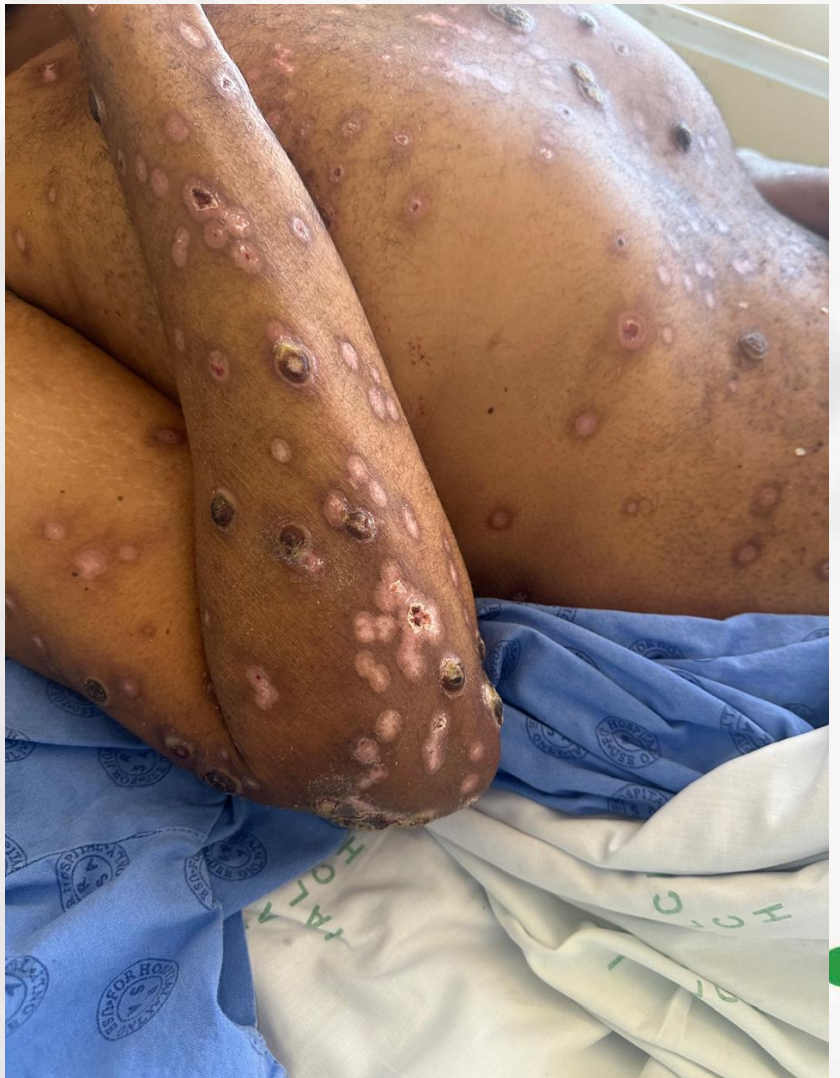
Severe mpox, newly diagnosed HIV on ART - compliance issues
Good response to tecovirimat – ‘self discharge’



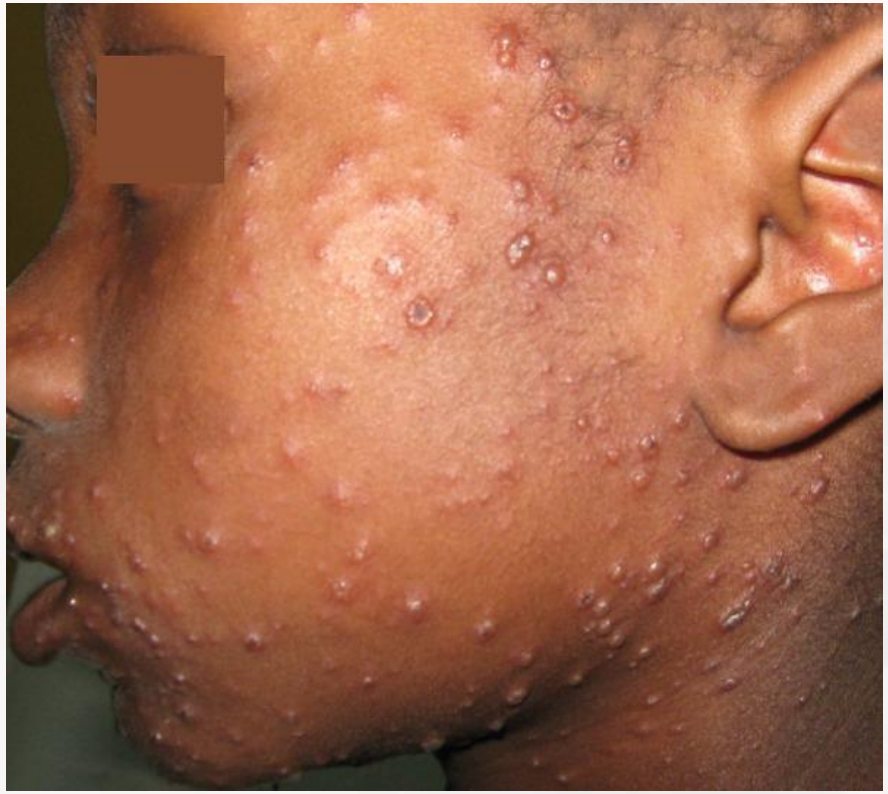
Readmission: new active mpox lesions

<u>NOT IRIS</u>, rather progressive mpox needing longer tecovirimat therapy



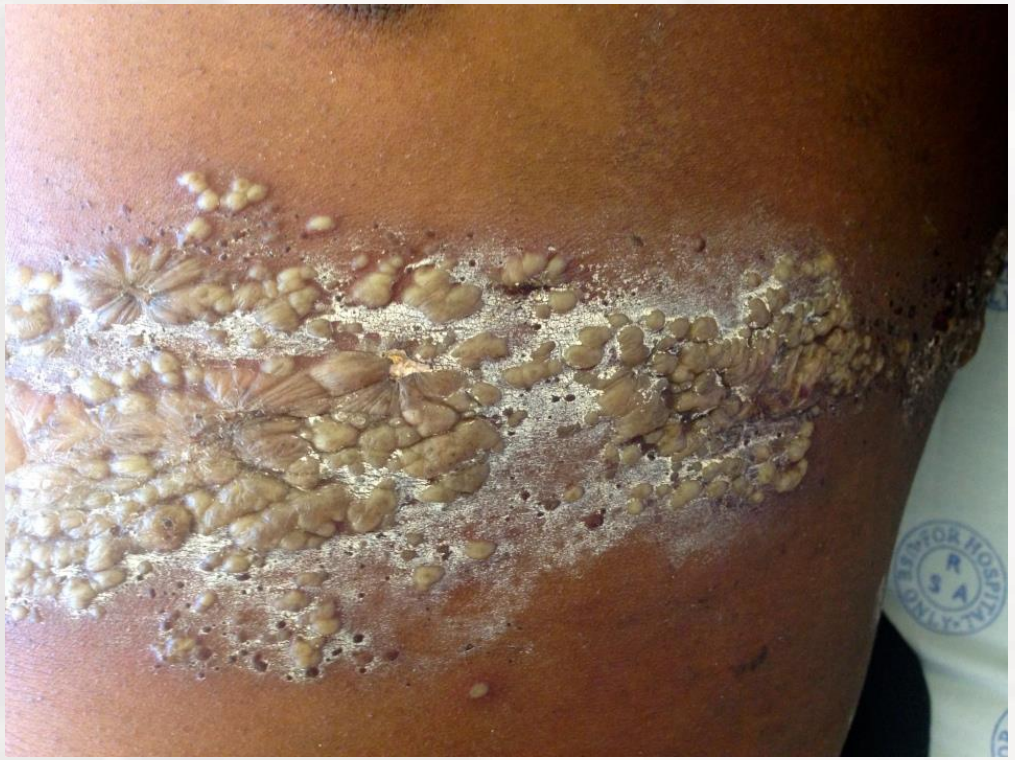


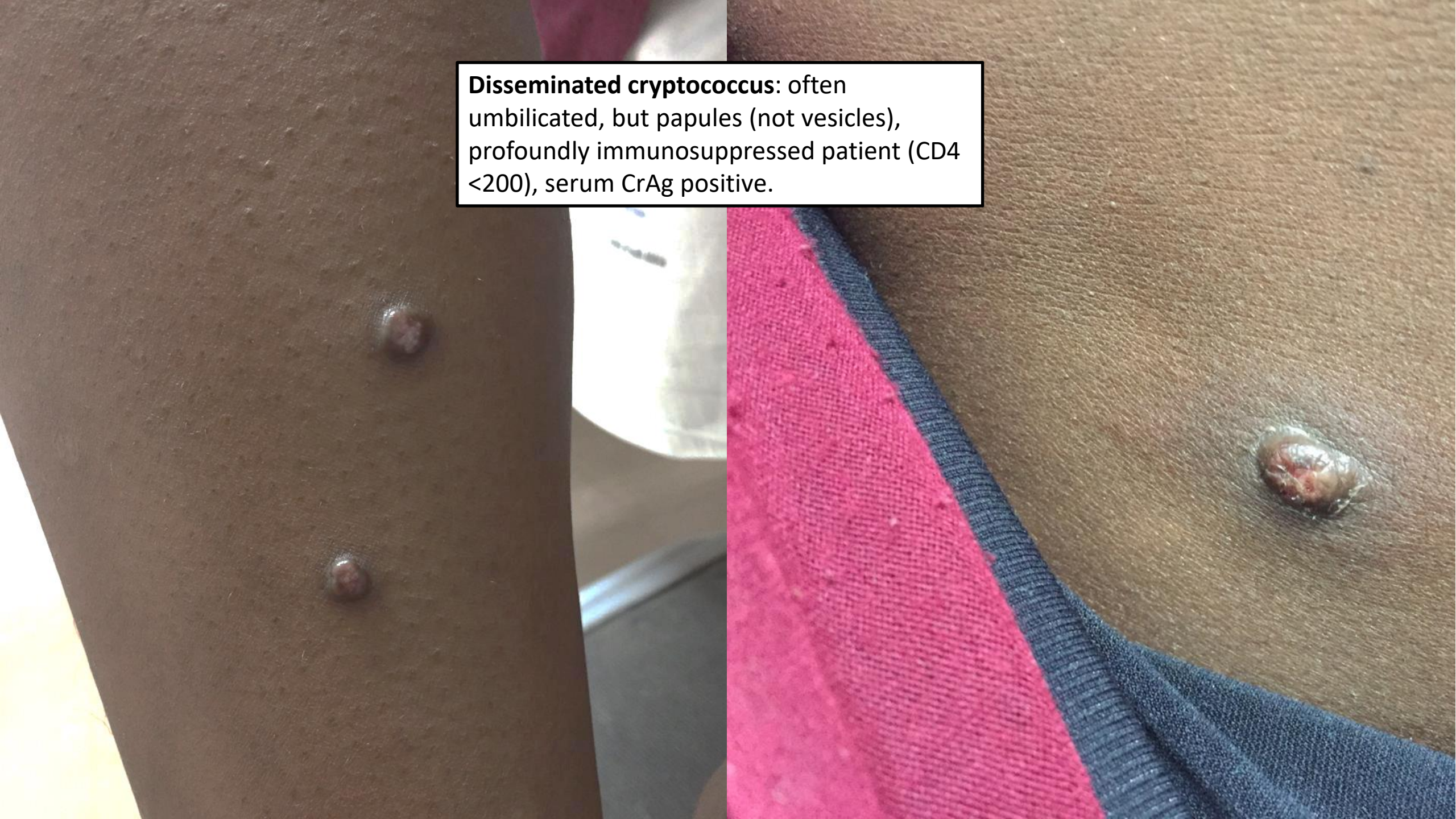
Other options in HIV patients



Chickenpox: itchy papules that become vesicular and sometimes pustular. Begins on face usually, then spreads centripetally. Prodrome of fever and malaise.

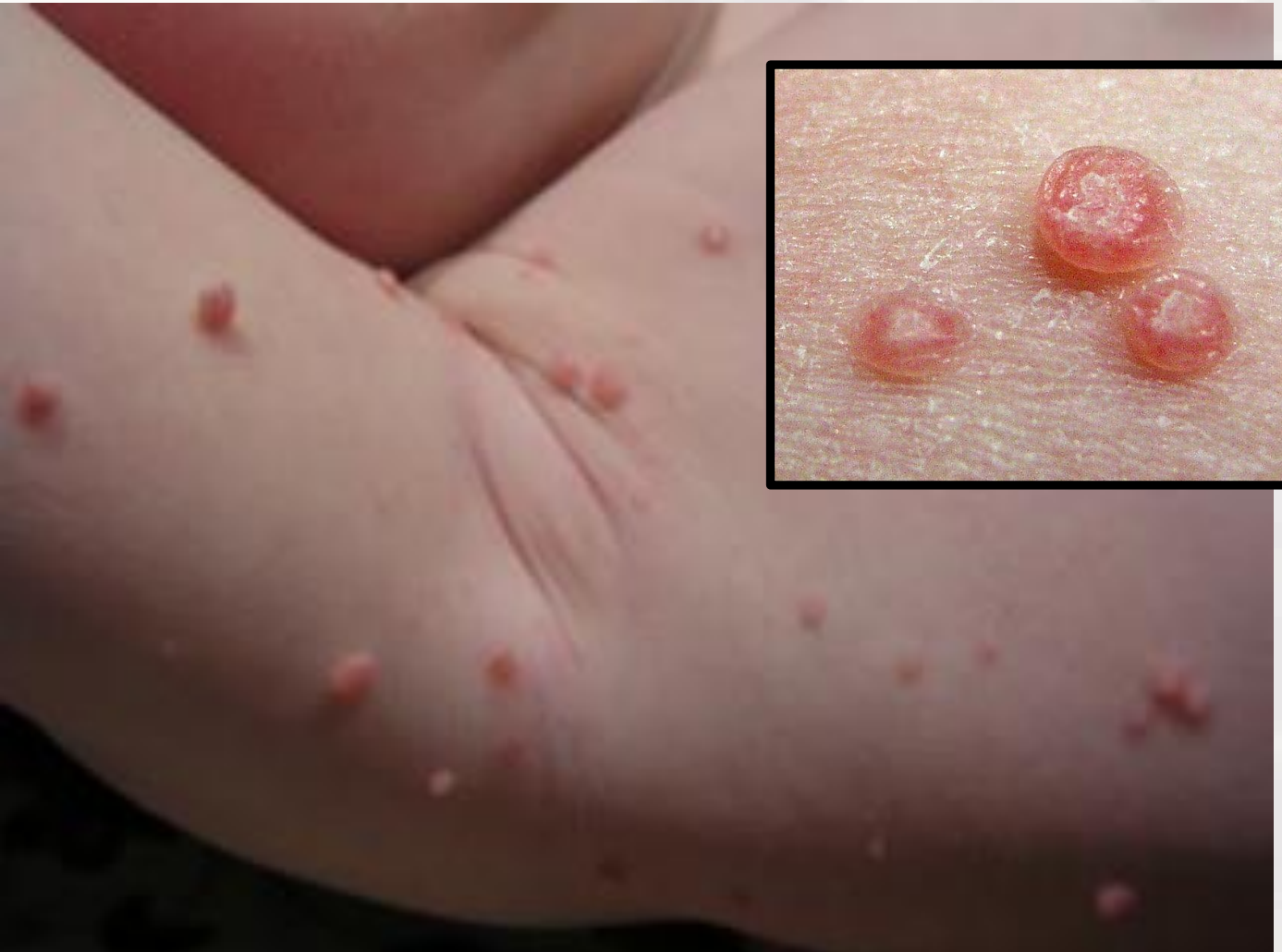
Zoster: same evolution, but pain more prominent and itching less so. Dermatomal distribution.





Disseminated cryptococcus: often umbilicated, but papules (not vesicles), profoundly immunosuppressed patient (CD4 <200), serum CrAg positive.

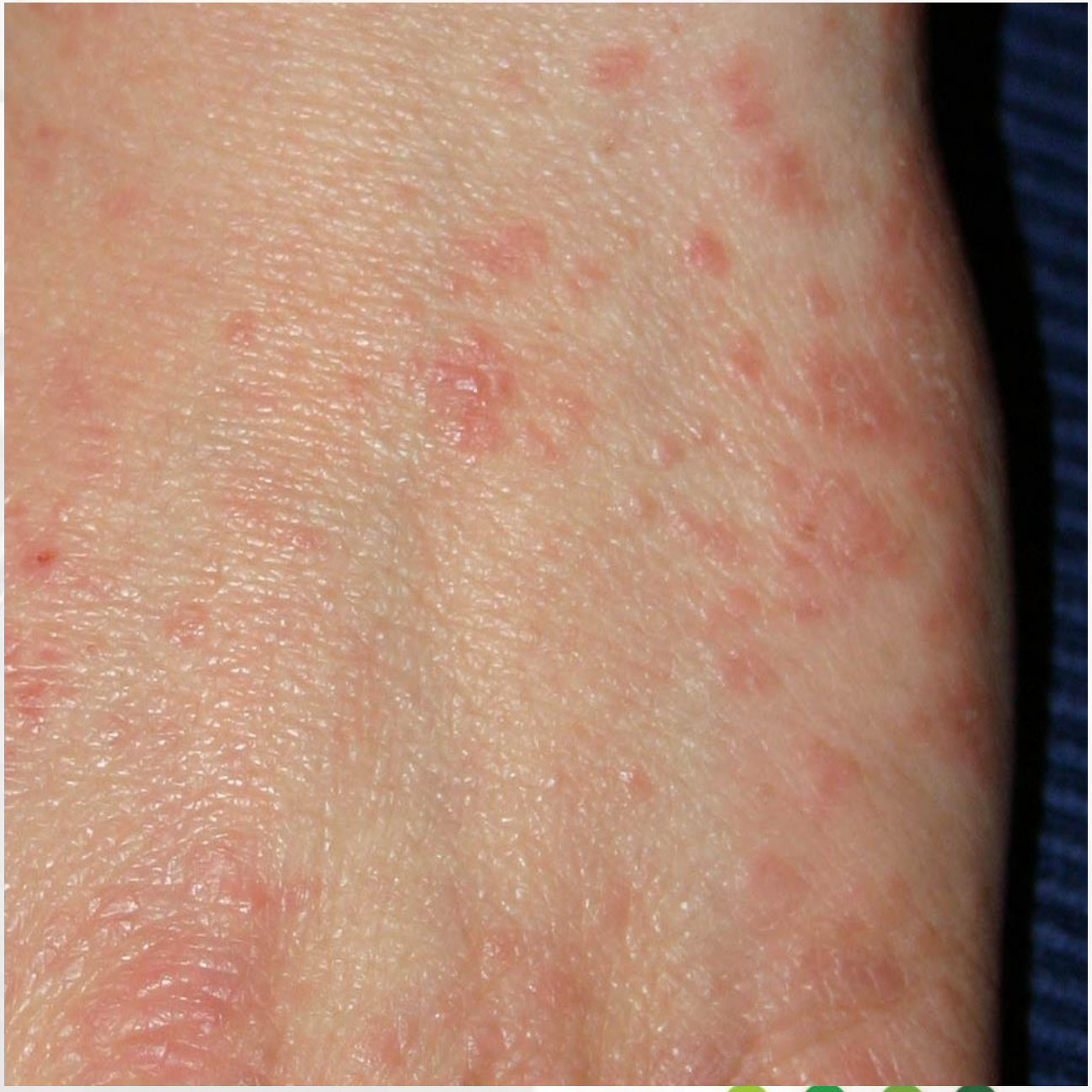
Other options



Molluscum contagiosum: smaller (2-5mm), usually infects children, though also associated with HIV too (in which case they're sometimes bigger).
Firm papules (not vesicles).
Umbilicated, skin-coloured/pinkish.
Resolve spontaneously in weeks/months in non-immunocompromised individuals (much slower evolution)

Scabies

- Intense itching, with onset of pustular rash
- Typical areas affected include the wrist, elbow, armpit, webbing between the fingers, nipple, penis, waist, belt-line, and buttocks –
- Small raised lines (burrows) may be visible on the skin, caused by the female scabies mite tunnelling beneath the skin surface
- Involvement of the palms, soles, head, face, and neck may be seen in infants and young children



Vesicles & Bullae

Infectious

- Viral:
  - **Herpesvirus** – HSV, VZV
  - **Enterovirus** (echovirus, coxsackie virus)
  - Poxvirus – variola, vaccinia
- Bacterial:
  - Staph aureus – TSS, SSSS
  - Streptococcus group A (TSS)
  - **Rickettsiae – R. africae**
  - V. vulnificus
  - M. pneumoniae

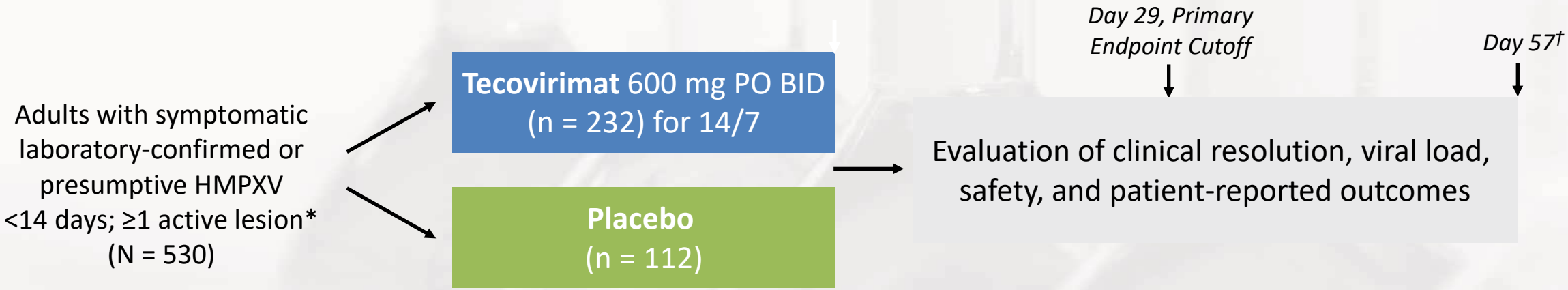
Non-infectious

- Acute eczema
- Erythema mutiforme
- TEN
- Thermal burn / frostbite
- Bullous pemphigoid

TREATMENT

STOMP trial

Mild-moderate disease, without severe immunosuppression



†Study was stopped early based on an interim futility analysis requested by the independent DSMB.

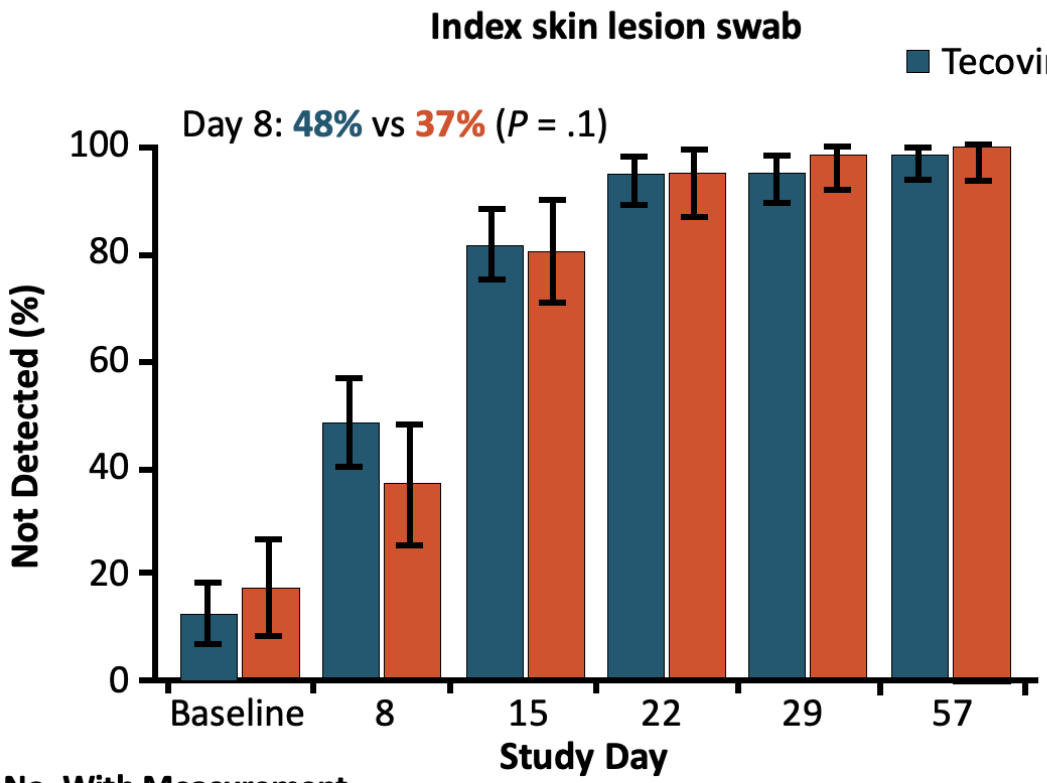
Primary endpoint: time to clinical resolution (defined as all skin lesions scabbed or epithelialized and all visible mucosal lesions healed) by Day 29

Secondary endpoints: daily pain score, mpox detection in various compartments, and patient-reported outcomes

Wilkin. CROI 2025. Abstr 201. NCT05534984.

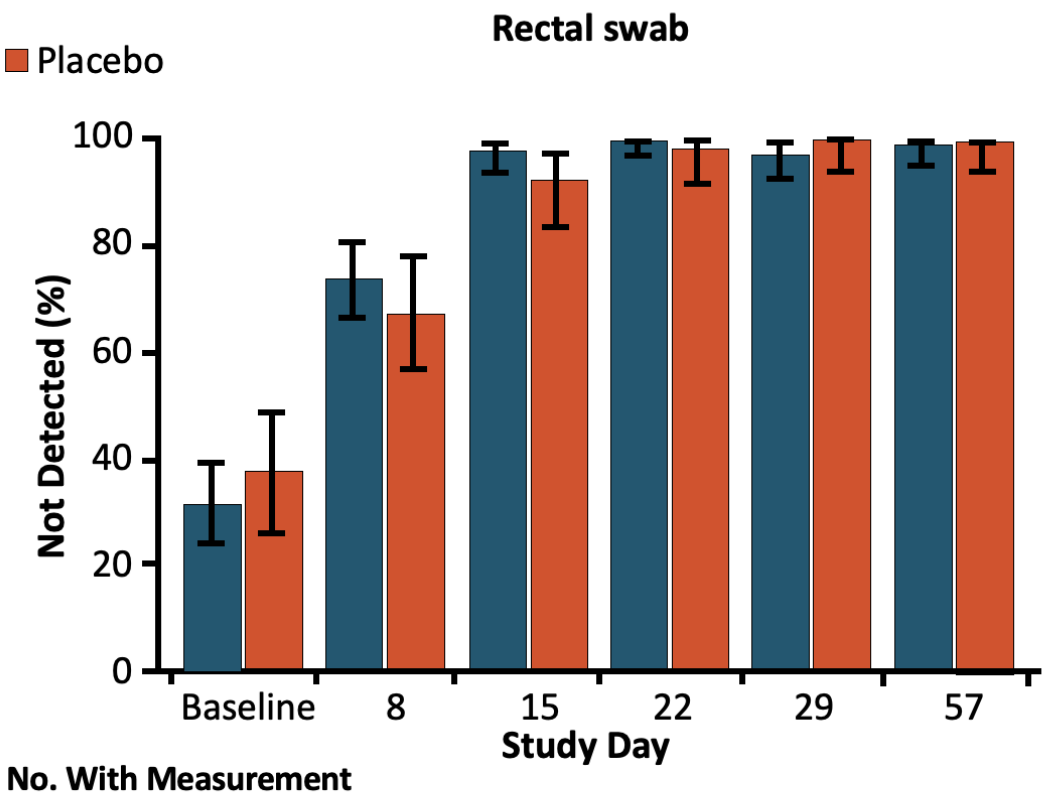
Results

STOMP: Viral Clearance



No. With Measurement

	Baseline	8	15	22	29	57
Tecovirimat	142	141	130	116	118	117
Placebo	70	71	66	62	65	60

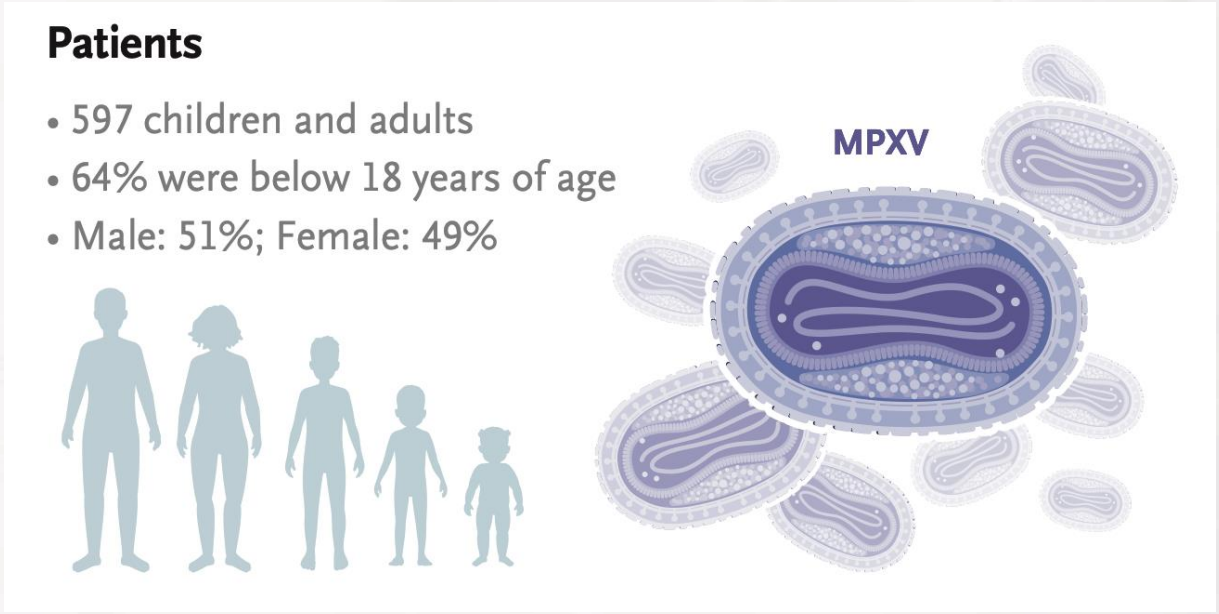


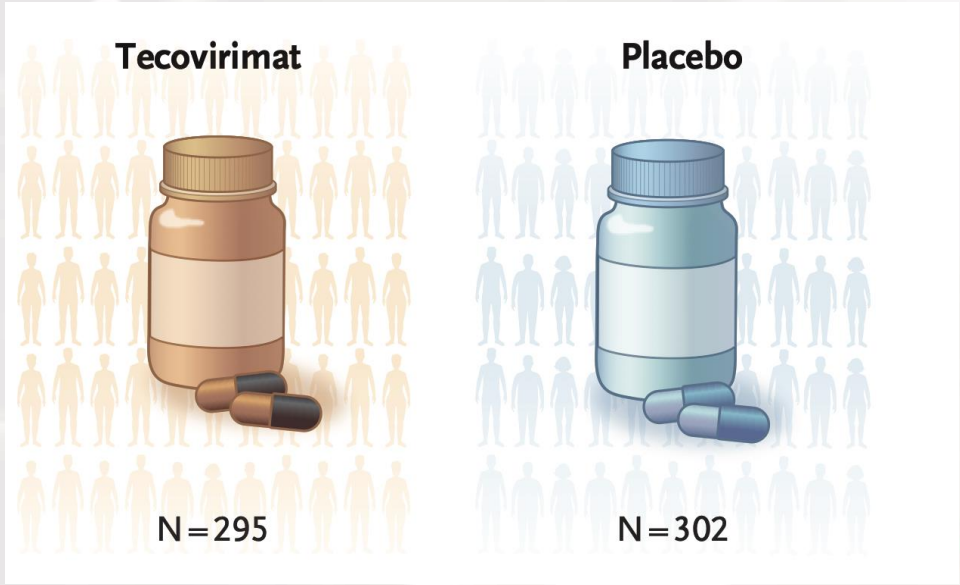
No. With Measurement

	Baseline	8	15	22	29	57
Tecovirimat	145	146	137	124	126	121
Placebo	69	71	69	64	65	60

PALM007 trial

- **Who?** Children & adults with confirmed mpox (clade I) & ≥1 skin lesion.
- **Where?** DRC
- **What?** Double-blind, placebo-based RCT
- **Outcome?** Time to lesion resolution (all lesions scabbed/epithelialised)

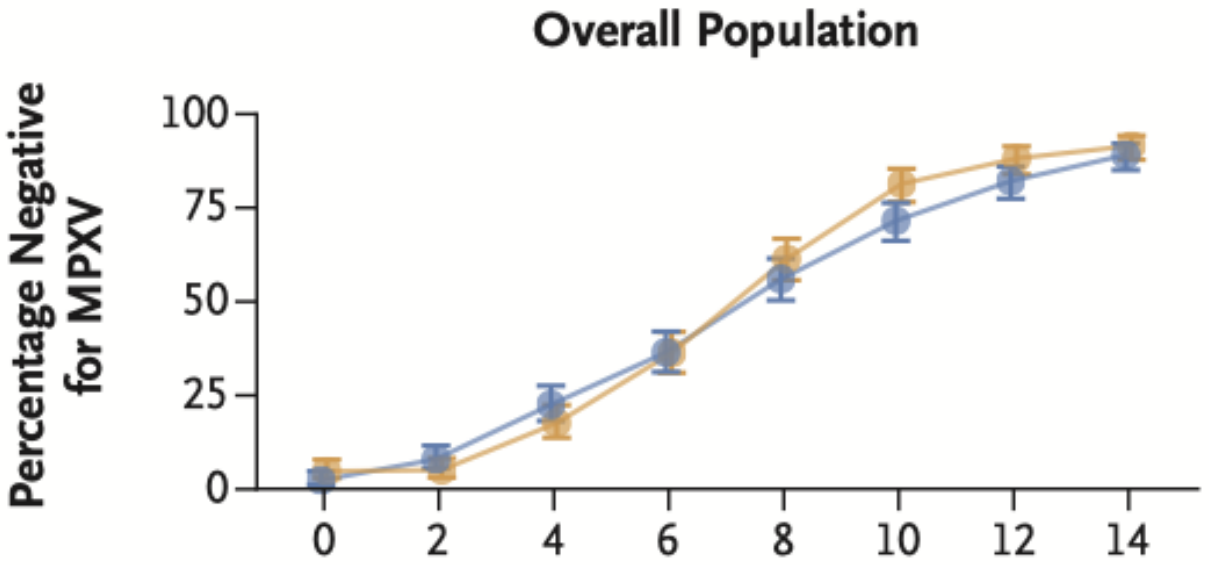




N Engl J Med. 2025 Apr 17392(15):1484-1496

PALM007 - Results

C Skin-Lesion Specimens



Percentage with Lesion Resolution								
Tecovirimat	0	0.7	13.2	33.9	59.7	80.3	87.1	90.8
Placebo	0	3.0	16.9	34.1	55.0	69.9	81.5	88.4

Also no difference whether started early (≤7 days) or late (> 7 days)

Treatment - summary

	STOMP	PALM007
Population	Mostly men	Men, women, children
Severity	Mild-moderate	All levels
Clade	II	I
Clinical effect?	No	No
Virological effect?	No	No
HIV	34%	0.7%
Severely immunosuppressed	No	Not known

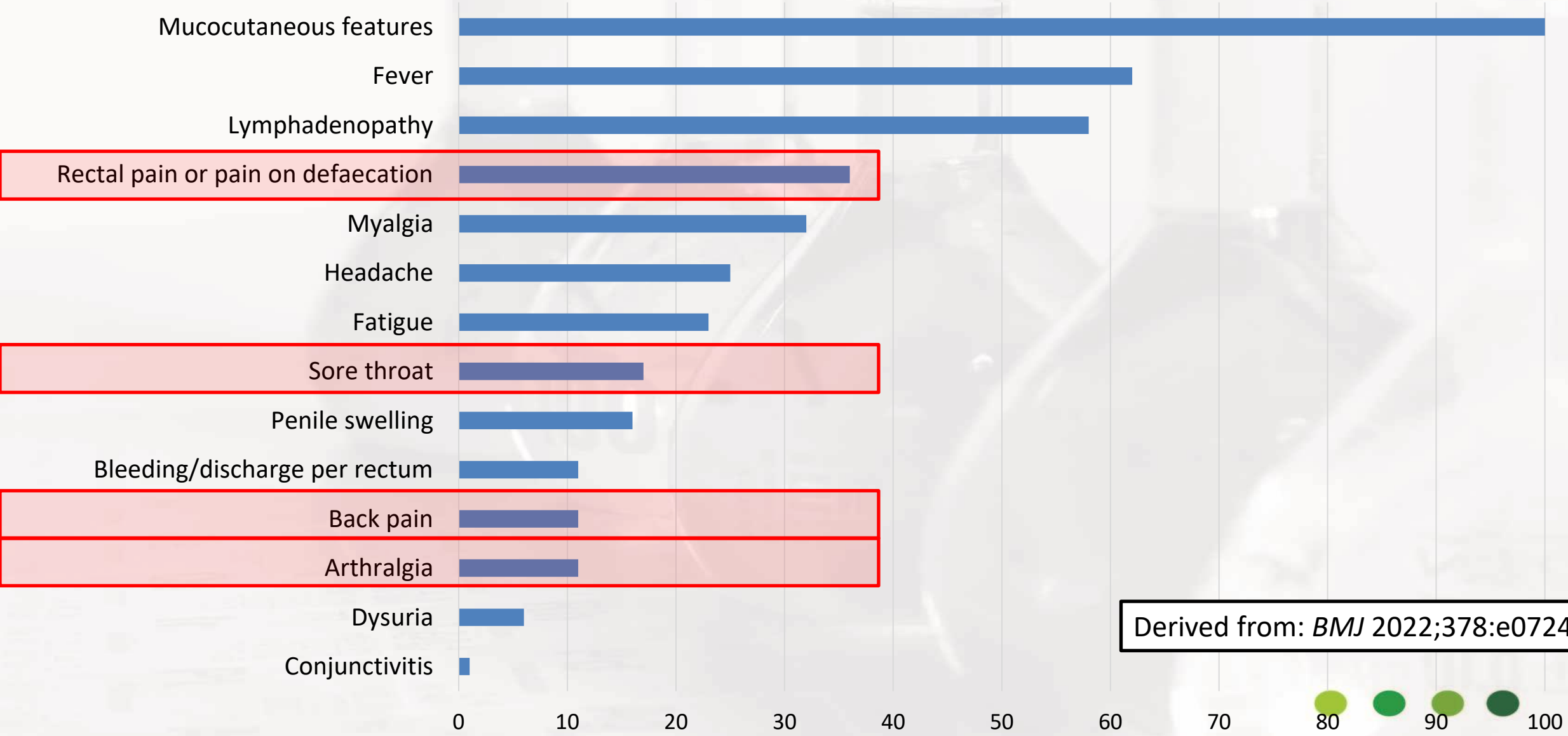
Is there still a role for tecovirimat in patients with advanced HIV and similarly immunosuppressed patients?

In South Africa

- Eligible if confirmed mpox AND symptomatic AND severe/complicated disease
- Contraindications: severe renal/hepatic impairment, pregnancy
- Section 21 application (fast-tracked)
- Stockpile centrally stored in Pretoria for both state and private sectors
- Treating physician completes section 21 progress report and WHO reporting tool

PAIN MANAGEMENT

Symptoms at presentation

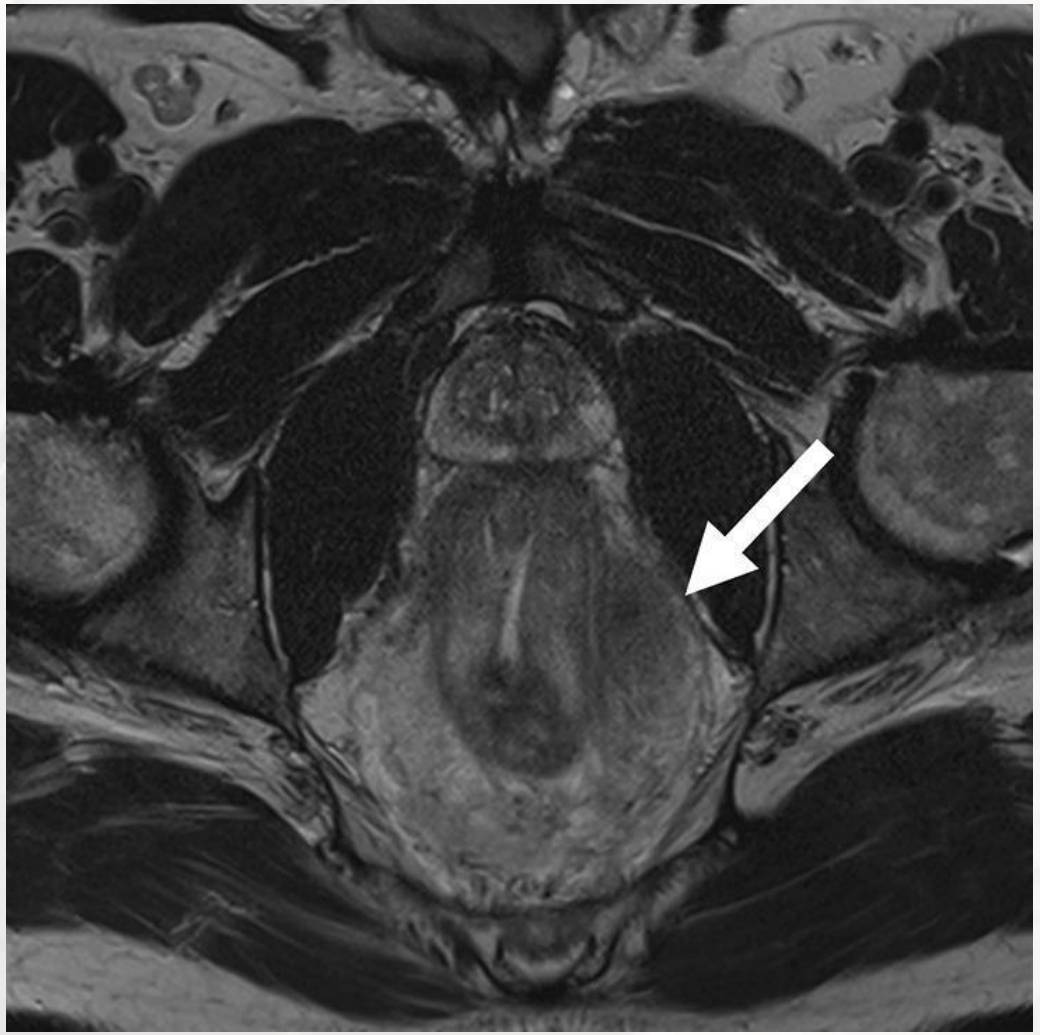


Derived from: *BMJ* 2022;378:e072410

Pain as the dominant symptom

- Skin lesions not typically that painful unless secondarily infected.
- But mucosal involvement often described as “10/10” pain.
- Pain is the most common reason for hospitalisation.
- Rectal pain → tenesmus or constipation.
- Penile pain → urinary retention
- Oral/pharyngeal pain → inability to eat or drink

T2 weighted magnetic resonance imaging scan of pelvis showing a 3.5 cm cavity in left mesorectum, adjacent to the rectal wall representing an area of localised perforation (arrow).



Aatish Patel et al. BMJ 2022;378:bmj-2022-072

Management of pain

- Rectal > penile >> skin

1. **Paracetamol**
2. add **NSAID** (e.g. ibuprofen 400mg 8 hourly)
3. add **tramadol** (start at 50mg qid; max 400mg daily)
4. replace tramadol with **morphine** (po solution, or IM, or IV)

Li et al. *Journal of Infectious Diseases.* 2023; 228:391-401

Pain – tips and tricks

- **Mouth: try to prevent secondary infection:**
  - Rinse with clean salt water 4x daily
  - Topical lidocaine gel
- **Genital/anorectal lesions:**
  - Sitz baths
  - Topical lidocaine gel
  - Constipation: lactulose, bisacodyl, senna
  - Tenesmus/spasms: hyoscine butylbromide

PREVENTION

Infectious period

- **Infectious until scabs have all fallen off** and there is a fresh layer of healthy skin underneath.
  - Usually takes 2-4 weeks

- Infectious period starts around the time when **symptoms** do.
  - Some evidence for infectious period preceding symptoms by a few days in rare cases.

BMJ 2022;379:e073153
J Med Virol. 2023 May;95(5):e28769

Precautions: Hospital

- Isolate in single-person room with dedicated bathroom.
- Keep door closed, but special air handling not required. (CDC)
- Limit patient movement outside of their room
  - If unavoidable, cover any exposed lesions and get patient to wear a medical mask.
- Perform aerosol-generating procedures like intubation/extubation in airborne infection isolation room.
- Standard disinfection and cleaning procedures & soiled laundry practices.

PPE: healthcare workers

- Gloves
- Gown
- Medical mask
- ± eye protection

Advice for home: while infectious

- Avoid close contact with others:
  - Own room & bathroom if possible.
  - Abstain from sex
  - Cover up lesions and wear mask when in close contact with others.
- Try to cover & manage own lesions

WHO suggests that persons with mild, uncomplicated mpox infection cared for at home are not required to isolate provided their lesions are covered and they wear a well-fitting medical mask when in close proximity with others until all lesions are healed.
(Conditional recommendation, low certainty evidence)

Contact monitoring

- Monitor close contacts for 21 days after last exposure.

- Individuals exposed to monkeypox virus can continue their routine daily activities (e.g., go to work or school) as long as they do not have signs or symptoms consistent with mpox.

VACCINATION

Vaccines

All originally developed as smallpox vaccines

	MVA-BN (Imvanex /Jynneos)	ACAM2000	LC16m8
Company	Bavarian Nordic	Emergency BioSolutions	KM Biologics
Type	Live, non-replicating modified vaccinia Ankara (MVA)	Live, replicating vaccinia virus	Live, attenuated vaccinia virus
Major approvals	FDA, EMA, WHO	FDA for smallpox	Japan (& WHO EUL)
Dosing	2 doses ≥ 28 days apart	1 dose	1 dose
Efficacy	66-90% effective (35-80% with 1 dose)	Extrapolated from smallpox data	Extrapolated from smallpox data
Side effects	Injection site reactions mostly	Injection site reactions mostly. Myocarditis. Can't be used in IMC.	Injection site reactions mostly. Caution in IMC.

Vaccine. 2024 Dec 242(26):126409

Vaccine rollout – Africa

- **WHO prequalification for MVA-BN in Sept 2024**
  - enabled organisations to more readily procure it for LMIC
- **Access and Allocation Mechanism (AAM) allocated 900,000 doses to 9 African countries**: DRC (85%), Kenya, Nigeria, South Africa, Rwanda, Uganda, Côte d'Ivoire, Liberia, and CAR
  - From Canada, Gavi, Vaccine Alliance, European Union, USA
- **Japan donated 3 million LC16m8 doses to DRC** via bilateral agreements.
- **Current status (mid-2025):**
  - 3 million doses distributed (~half MVA-BN, ~half LC16m8), but only 900,000 administered (69% in DRC). Target was 10 million within 6 months.
- **Reasons**: fragile local healthcare systems, funding shortages, poor supply chain management, vaccine shortages, delays in local approvals, wastage, weak local surveillance, stigma/mistrust

WHO. Mpox multi-country external situation report #56 (31 July 2025)

In South Africa

Section 21 approval for 10,000 doses

Eligibility:

- Gay, bisexual and MSM
- Sex workers & anyone participating in high-risk sexual behaviours
- Healthcare and lab workers at risk of exposure to patients/samples with mpox
- At-risk travelers to West and Central Africa
- Consider: PLWH in general too
- Contacts of persons with mpox – sexual, household, healthcare

- **Provincial vaccination sites in Gauteng, KZN, and Western Cape**
- **Screening tool & informed consent required**
- **Delayed-dose strategy (2nd dose once more stock available)**

Vaccine-escape variant – hopefully unlikely

- **DNA virus – low mutation rate**
- **Breadth of vaccine protection is wide:**
  - At least 100-200 conserved T-cell epitopes across orthopoxviruses (MPXV shares ≥71% with vaccinia)
  - 6-10 major proteins targeted for humoral response
  - Includes peptides from multiple viral lifecycle stages (attachment, entry, replication)
- **No evidence of significantly reduced efficacy with new variants yet**
- **New vaccines in the pipeline too**