New York State and New York City Health Departments Provider Webinar Special Event Co-Hosted by the Skin of Color Society

DERMATOLOGIC CONSIDERATIONS FOR MONKEYPOX AMONG PEOPLE OF COLOR

September 29, 2022







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The information presented is based on our knowledge as of 9/28/22 and is subject to change

A DERMATOLOGIST PERSPECTIVE ON VIRUS AND VACCINES

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DISCLOSURES

Dr. Freeman is the Principal Investigator of the AAD/ILDS Dermatology Registry for COVID-19, Monkeypox, and Emerging Infections. The registry receives grant support from the ILDS and in-kind support from the AAD. She is a member of the AAD Ad Hoc Task Force To Create Monkeypox Content. She is a member of the WHO Guideline Committee for Monkeypox Guidelines. She is a co-author for Up To Date's COVID-19 content, chair of the GLODERM- International Alliance for Global Health Dermatology, and section editor the the British Journal of Dermatology's Global Health and Equity section. Cases should be reported to local health jurisdictions. In addition, you can share your de-identified cases to...





A HISTORICAL PRIMER

Orthopoxvirus

- Shares a genus with variola (Smallpox)
 & vaccinia viruses (smallpox vaccine)
- First isolated: Denmark (late 1950s) from a colony of lab monkeys from Singapore being used for polio research



Herrera E, del mar Lorenzo M, Blasco R, Isaacs SN. J Virol 1998; 72:294. https://microbeonline.com/monkeypox-virus-frequently-asked-question/ Von Magnus P, et al. Pathol Microbiol Scand. 1959;46(2):156

2022 OUTBREAK

- May 7th United Kingdom
 - May 17th U.S.
 (Massachusetts)
- July 10th 9 states and 28 non-endemic countries and territories
- July 23, 2022 WHO declared this outbreak of monkeypox a public health emergency of international concern



European Centers for Disease Control. Monkeypox cases reported in UK and Portugal. https://www.ecdc.europa.eu/en/news-events/monkeypox-cases-reported-uk-and-portugal Minhaj FS. MMWR Morb Mortal Wkly Rep. 2022;71(23):764. Epub 2022 Jun 10 https://www.cdc.gov/poxvirus/monkeypox/response/2022/world-map.html





Edouard Mathieu, Fiona Spooner, Saloni Dattani, Hannah Ritchie and Max Roser (2022) - "Monkeypox". Published online at OurWorldInData.org. Retrieved from: 'https://ourworldindata.org/monkeypox' [Online Resource] Cumulative monkeypox cases per million by state





CLINICAL MANIFESTATIONS

TRANSMISSION

- Direct contact via infectious lesions, scabs, or body fluids
- Indirect contact through fomites
 - Touching objects, fabrics (clothing, bedding, or towels), and surfaces that have been used by someone with monkeypox.
- Respiratory droplets
 - During direct and prolonged face-to-face contact
- Vertical transmission during pregnancy
- Zoonotic transmission
 - Being scratched or bitten by the animal or by preparing or eating meat or using products from an infected animal

"CLASSIC" CLINICAL MANIFESTATIONS

- Incubation period is 5-21 days
- Classic Course:
 - Prodrome \rightarrow fever, malaise, headache, and lymphadenopathy
 - Followed by generalized rash (beginning on the face and then spreading to other parts of the body- legs, trunk, arms, palms, soles, genitalia, etc.)
 - Duration of 2-4 weeks
 - Rash typically progressed through the following stages:





Lesions from endemic area

2022 FINDINGS

- **Onset:** Systemic illness prior to or after skin symptoms?
- Lymphadenopathy: Localized vs. Generalized
- Associated Symptoms: Proctitis and ulcerative pharyngitis/tonsillitis



Tarín-Vicente, Eloy José et al. The Lancet, Volume 400, Issue 10353, 661 – 669. Thornhill, J. P., et al. (2022 New England Journal of Medicine **387**(8): 679-691. Minhaj FS, et al. MMWR Morb Mortal Wkly Rep. 2022;71(23):764. Epub 2022 Jun 10

ROLE OF CUTANEOUS SYMPTOMS IN DETECTION

In two large studies from Spain (366 cases),

- 100% of patients had at least one skin finding
- 52-64% had skin findings appearing prior to or at the same time as systemic symptoms

LESION PROGRESSION



Clinical Recognition. August 23, 2022. Content source: Centers for Disease Control and Prevention. https://www.cdc.gov/poxvirus/monkeypox/clinicians/clinical-recognition.html



CUTANEOUS FINDINGS

Location: Mucosal areas (genital, perianal or oral)

Initial Lesion:

- Pesudopustules
- Vesiculopustular
- Pustular

Distribution & number

- Localized or scattered vs. generalized
- < 20 lesions</p>



Català, A, et al. Br J Dermatol. 2022 Thornhill, J. P., et al. (2022 New England Journal of Medicine **387**(8): 679-691











LONG TERM SCARRING

- Monkeypox scars seen in up to 10% of individuals (in endemic countries)
- Permanent pitted scarring is seen secondary to bacterial superinfection



Jezek Z, et al. Bull World Health Organ. 1988;66(4):459-64. PMID: 2844428; PMCID: PMC2491168 Beer EM, Rao VB. PLoS Negl Trop Dis. 2019 Oct 16;13(10):e0007791. PMID: 31618206 Agarwal, N., et al. (2013). Journal of cutaneous and aesthetic surgery **6**: 144-147.

COMING SOON TO THE AMERICAN ACADEMY OF DERMATOLOGY'S WEBSITE...

Monkeypox: Caring for the Skin

Methods to reduce scarring include...

Avoidance of trauma to healing areas

Sun protection (SPF 30+)

Silicone - based gels or sheets

https://www.aad.org/member/clinical-quality/clinical-care/monkeypox

Reynolds, MG, et al. Viruses. 2017 Meaume, S, et al. Eur J Dermatol. 2014 Gold, MH, Derm Surg. 2014





Total Vaccine Doses Administered

540,150

Doses Administered in the 39 U.S. Jurisdictions Reporting Data as of September 13, 2022.

Total vaccine doses administered data are updated every Wednesday as soon as they are reviewed and verified. Information about the number of vials shipped is posted on <u>https://aspr.hhs.gov/SNS/Pages/JYNNEOS-Distribution.aspx</u>, and is updated every Monday, Wednesday, and Friday.



Date Administered

Monkeypox cases reported to CDC: Race/Ethnicity by Week



MMWR Week

Race / Ethnicity

- Other Race
- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic or Latino
- Multiple Races
- Native Hawaiian or Other Pacific Islander
- White

JYNNEOS Vaccine Doses Administered, by Race/Ethnicity 204,006 White, non-Hispanic 91,280 Hispanic 50,475 Black, non-Hispanic 31,644 Asian, non-Hispanic 10,666 Other, non-Hispanic 1,152 American Indian/Alaska Native, non-Hispanic 6,930 Multiple, non-Hispanic 1,025 Native Hawaiian/Other Pacific Islander, non-Hispanic 38,232 Unknown

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Race / Ethnicity

200,000

Number of Doses Administered

100,000

Monkeypox Vaccine Administration U.S. Map. September 20 2022. CDC Monkeypox Cases by Age and Gender, Race/Ethnicity, and Symptoms. 21 Sep 2022. CDC Cases should be reported to local health jurisdictions. In addition, you can share your de-identified cases to...



Thank you to the American Academy of Dermatology's Ad Hoc Task Force to Develop Monkeypox Content And thank you to my research fellow, Alexis Strahan MS-IV.

Monkeypox Vaccine and Risk of Keloidal Scarring

Donald A Glass II, MD, PhD Associate Professor, Dermatology UT Southwestern Medical Center Immediate Past President, Skin of Color Society

September 29th, 2022





Monkeypox vaccines

- There are two different vaccines against monkeypox being offered:
- The JYNNEOS vaccine is approved for prevention of smallpox and monkeypox. It
 is the primary vaccine being used during this outbreak in the U.S.
- The ACAM2000 vaccine is an alternative to JYNNEOS. It is also approved to help protect against smallpox and monkeypox

JYNNEOS vaccine



JYNNEOS vaccine

- Imvamune or Imvanex internationally
- also known as the Modified Vaccinia Ankara (MVA) vaccine
- produced by Bavarian Nordic (Denmark)



- third-generation vaccine based on a live, attenuated non-replicating orthopoxvirus, Modified Vaccinia Ankara (MVA)
 - a live virus but it does not replicate efficiently in humans
- approved in 2019 by the FDA for prevention of smallpox and monkeypox disease in adults 18 years of age and older determined to be at high risk for smallpox or monkeypox infection
- two doses administered beneath the skin (subcutaneously), four weeks (28 days) apart

https://www.fda.gov/news-events/press-announcements/monkeypox-update-fda-authorizes-emergency-use-jynneos-vaccine-increase-vaccine-supply,

accessed Sept 21, 2022

- https://www.cdc.gov/poxvirus/monkeypox/interim-considerations/overview.html, accessed Sept 22, 2022
 - https://aspr.hhs.gov/SNS/Pages/JYNNEOS-Distribution.aspx, accessed Sept 22, 2022
- https://www.bostonglobe.com/2022/07/22/world/eu-drug-regulator-recommends-clearing-vaccine-monkeypox/

SC vs ID Administration

• On August 9, 2022, the FDA issued an EUA allowing for intradermal (ID) administration of a smaller dose of the JYNNEOS vaccine into the forearm (like a tuberculosis skin test)

• Data from a 2015 clinical study of the JYNNEOS vaccine demonstrated that a fifth of the dose, when given ID on the same two-dose schedule as currently administered, produced an immune response that was similar to subcutaneous (SC) dosing

• The smaller dosing will increase the overall number of doses available by up to 5 times while providing similar immune response

Routes of Vaccine Administration



Intradermal injection



Comparison of lyophilized versus liquid modified vaccinia Ankara (MVA) formulations and subcutaneous versus intradermal routes of administration in healthy vaccinia-naïve subjects



• Local reactogenicity lasting at least 30 days, unexpected nodules and skin discoloration at the vaccination site, accounted for 389 (80%) of the total unsolicited adverse events

- 50/165 (30.3%) who received Lyophilized-SC
- 42/167 (25.1%) who received Liquid-SC, and
- 128/191 (67.0%) who received Liquid-ID groups, respectively.
- The proportion of local reactogenicity for the Liquid-ID group was significantly higher than the Liquid-SC group (P < 0.0001).

Eligibility for Monkeypox Vaccination

• Eligibility for monkeypox vaccination may change as the outbreak evolves and based on vaccine supply. Refer to your local jurisdiction for updated information regarding eligibility

- Current eligibility for the JYNNEOS vaccine:
 - Post-exposure prophylaxis (PEP) if you have been identified as a close contact of someone with monkeypox
 - Post-exposure prophylaxis (PEP) for individuals who may be at high risk for recent exposure

CDC Guidelines

Vaccination Schedule and Dosing Regimens for JYNNEOS Vaccine							
JYNNEOS vaccine regimen	Route of administration	Injection volume	Recommended number of doses	Recommended interval between 1st and 2nd dose			
Alternative regimen							
People age ≥18 years	ID	0.1 mL	2	28 days			
Standard regimen							
People age ≤18 years	SQ	0.5 mL	2	28 days			
People of any age who have a history of developing keloid scars	SQ	0.5 mL	2	28 days			

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Keloids



- The result of an exaggerated response to wound healing
- Raised scars which grow invasively beyond the boundaries of the original wounds
- Cause significant cosmetic defects and morbidity (pain and/or pruritus)

Epidemiology of Keloids

- Highest incidence between 10 to 30 years of age (mean age 23)
- No known gender bias
- Increased incidence in skin of color individuals

- Predilection for the chest, upper back, shoulders, and earlobes
- Higher incidence during pregnancy and puberty



Epidemiology of Keloids

- Can be incited by any antecedent trauma:
 - surgery
 - piercings
 - vaccinations

- cuts
- acne/folliculitis
- "spontaneous"
- Associated with comorbidities:
 - Hypertension
 - Fibroids
 - Atherosclerosis
 - Coronary stent restenosis
 - Atopic dermatitis

Bhavsar et al., *Clin Invest Med*. 2009;32:e95-102 Catherino et al., *Genes Chromosomes Cancer*. 2004;40:204-17. Leppert et al., *Am J Obstet Gynecol*. 2006;195:415-20 Lu et al., *BMJ Open*. 2018;8:e022865 Ozdol et al., *J Cutan Med Surg*. 2007;11:206-10 Snyder et al., *Lancet*. 1996;347:465-6 Woolery-Lloyd & Berman, *Eur J Dermatol*. 2002;12:581-2



Single-Site versus Multiple-Site Keloids



211 cases of keloid scarring:

122 participants with single anatomical site scars 89 participants with a total of 369 scars in multiple sites

The most common cause of keloid scars in the upper limb region (deltoid region, upper & lower arm) was vaccination, followed by chicken pox and lacerations

Keloid Incidence differs among Racial/Ethnic Groups

- Up to 15-fold higher in Africans, Hispanics, Asians than Europeans
 - African descent: estimated 4-6%, as high as 16% in the Congo
 - Caucasians: as low as 0.1% in the U.K.
- In North America, 3x -7x increased incidence in Black patients vs White patients
 - Caeserean sections performed at McGill University in Montreal, Canada
 - Head and neck surgeries performed at Henry Ford in Detroit

Hahn & Supp. *Burns*. 2017;43:1506-15 Kelly. *Semin Cutan Med Surg*. 2009;28:71-6 Mamalis & Jagdeo, *Dermatol Surg*. 2015;41:35-9 Marneros et al., *Arch Dermatol*. 2001;137:1429-34 Tulandi et al. Am J Obstet Gynecol. 2011;204:132.e1-4 Young et al. JAMA Facial Plast Surg. 2014;16:379-80

Risk of Keloid Formation from other Vaccinations

- BCG
- Zostafax
- Smallpox (ACAM2000)

Risk of Keloids from BCG Vaccination

- Bacillus Calmette-Guerin (BCG) vaccination has been performed since 1921
- Keloid occur in up to 5% of BCG vaccinations
- Case reports detail the development of large keloids after BCG vaccination
- No reports of keloidal scarring from tuberculin test (intradermal on inner forearm)



Risk of Keloid from Shingles Vaccination

- Zostafax previously indicated for people 60 years old and older to prevent shingles and post-herpetic neuralgia (PHN)
- Administered subcutaneously as a single dose in the deltoid region
- Multiple reports of keloids after chickenpox but no reports of keloid occurrence from the Zostavax vaccine



Risk of Keloid from Smallpox Vaccination

- ACAM2000 for vaccination against smallpox
- Contains a live Vaccinia virus that can be spread to others
- Administered to deltoid region with bifurcated needle
- Cases of hypertrophic / keloidal scarring after smallpox vaccination
- Other sequelae from ACAM2000 vaccination includes vaccinia and eczema vaccinatum

Abnormal Scarring from Smallpox Vaccine



The ACAM 2000 Smallpox Vaccine and Progressive vaccinia and Eczema Vaccinatum

Progressive Vaccinia:

- Severe localized or systemic infection with vaccinia
- Seen in persons with weakened immune systems



Eczema Vaccinatum:

- Generalized or severe local vesiculopustular rash
- Seen in persons with atopic dermatitis or other eczematous conditions

Centers for Disease Control and Prevention (CDC). MMWR Morb Mortal Wkly Rep 2009; 58:532. ACAM2000, (Smallpox (Vaccinia) Vaccine, Live). FDA Package Insert.

JYNNEOS (Smallpox and Monkeypox Vaccine, Live, Nonreplicating). FDA Package Insert

Household Transmission of Vaccinia Virus from Contact with a Military Smallpox Vaccine. MMWR Morb Mortal Wkly Rep 2007; 56:478.

Jennifer L. Reed, et al. Clinical Infectious Diseases, Volume 54, Issue 6, 15 March 2012, Pages 832-840



Summary

- JYNNEOS vaccine for those eligible for vaccination against monkeypox
- CDC guidelines for JYNNEOS intradermal for those ≥ 18 years of age; SC for those < 18 or those with a history of keloids
- Risk of keloid occurrence on the inner forearm area is low in general
- Documentation from administration of these vaccines will provide insight into scarring risk from JYNNEOS
- Risk of cutaneous sequelae from monkeypox infection is higher than that from JYNNEOS vaccination

Resources

NYSDOH: Monkeypox (ny.gov)

- Palm Card
- Information Card
- SMS text notification to 81336: English – MONKEYPOX Spanish - MONKEYPOXESP

NYC Health Department: nyc.gov/monkeypox

- Text MONKEYPOX" to 692-692 or, for Spanish, text "MONKEYPOXESP
- Monkeypox Information for Providers NYC Health

CDC: Information For Healthcare Professionals | Monkeypox | Poxvirus | CDC

Skin of Color Society: https://skinofcolorsociety.org/





