

# Monkeypox Vaccination and Cutaneous Considerations for the Dermatologist

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## INTRODUCTION

Monkeypox has infected over 18,000 individuals in the United States since the first reported case on May 17, 2022.<sup>1</sup> Monkeypox is a variola poxvirus that is related to smallpox, but monkeypox symptoms (fever, painful vesicular or pustular rash, and lymphadenopathy) are milder and fatalities are rare. Routine US smallpox vaccinations prior to 1972 may confer some protection, but immunity is thought to wane quickly. After Emergency Use Authorization (EUA) on August 9, 2022, two smallpox vaccines, JYNNEOS (August EUA) and ACAM2000, are now recommended for monkeypox in high-risk individuals given potentially rapid transmission through person-to-person direct contact with infectious rashes and body fluids.<sup>1</sup> Dermatologists can aid in vaccination selection for patients with pre-existing dermatological ailments.

JYNNEOS (replication-deficient live-attenuated modified vaccinia Ankara) first received FDA approval in 2019 for smallpox and monkeypox prevention in high-risk adults ≥18 years of age via subcutaneous (SC) injection of two doses four weeks apart, with safety and efficacy in immunocompromised patients due to its replication-deficient status. Shortages of JYNNEOS prompted an FDA Emergency Use Authorization on August 9,

2022, allowing intradermal (ID) injection of one-fifth the normal SC JYNNEOS dose to produce a comparable immune response.<sup>2</sup> However, ID administration may trigger local reactogenicity with some reports of nodules and discoloration at the injection site, though these events do not preclude emergency use.<sup>3</sup>

ACAM2000, though in much greater supply than JYNNEOS, requires localized active infection with live vaccinia by pricking the skin, forming a blister similar to its pre-1972 smallpox Dryvax routine vaccine precursor.<sup>1</sup> Virus can be transmitted from vaccinated to unvaccinated individuals through contact with the inoculation site, thus additional care and occlusion are required compared to JYNNEOS. Furthermore, ACAM2000 may cause infection and severe reactions in immunocompromised patients due to its proliferative capacity,<sup>4</sup> which limits widespread use as over one-third of monkeypox infections have occurred in individuals living with HIV.<sup>5</sup>

As both monkeypox infections and vaccinations rise, dermatologists can play a critical role in identifying disease, providing counseling on JYNNEOS and ACAM2000 indications in the setting of vaccine shortages and pre-existing dermatologic

TABLE 1.

Comparison of ACAM2000 and JYNNEOS Monkeypox Vaccination Indications and Adverse Reactions for Individuals With Dermatologic and Other Medical Conditions			
	ACAM2000	Subcutaneous JYNNEOS	Intradermal JYNNEOS
Indications	No history of immunocompromising conditions. <sup>1</sup>	History of keloid scarring; individuals < 18 years. <sup>1</sup>	Atopic dermatitis, eczema, or other exfoliative skin conditions; pregnancy, breastfeeding; individuals with major cardiac risk factors; history of prior smallpox vaccination. <sup>1</sup>
Known Adverse Reactions	Rash, headaches, fever, or body aches in immunocompetent individuals. <sup>3</sup> Potential for severe reactions including myopericarditis in immunocompromised. <sup>4</sup>	Redness, pain and /itching, induration, swelling, fatigue, headaches, nausea, chills, fever. <sup>3</sup>	Local adverse reactions >30 day duration, nodules, discoloration. <sup>3</sup>

conditions, as well as reporting adverse effects by route of administration (Table 1). Vaccines for prophylaxis can also be advised within 96 hours of exposure,<sup>1</sup> preventing and mitigating disease given the long incubation period of monkeypox.<sup>6</sup> In light of cutaneous monkeypox manifestations and vaccination considerations, dermatologists should be prepared to educate patients about appropriate options and risks, especially for highly susceptible individuals.

## DISCLOSURES

Dr. Dellavalle is a Joint Coordinating Editor for *Cochrane Skin*, a dermatology section editor for *UpToDate*, a Social Media Editor for the *Journal of the American Academy of Dermatology (JAAD)*, Editor-in-Chief of the *Journal of Medical Internet Research (JMIR) Dermatology*, and co-chair of *Cochrane Council*.

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