



Use of Vaccinia Virus Vaccine in Persons at Risk for Occupational Exposure to Orthopoxviruses: Introduction

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October 24, 2019

Background

- *Poxviridae* are a family of DNA viruses that infect a broad range of hosts
- *Orthopoxvirus* genus includes several species that cause disease in humans
 - *Variola virus* (causative agent of smallpox)
 - *Vaccinia virus* (principal source of smallpox vaccine)
 - *Monkeypox virus* (cause of multiple outbreaks in Africa and imported cases to other countries including U.S.)
 - Cowpox virus (endemic in Europe)
 - Newly discovered species (*Akhmeta virus*, *Alaskapox virus*)

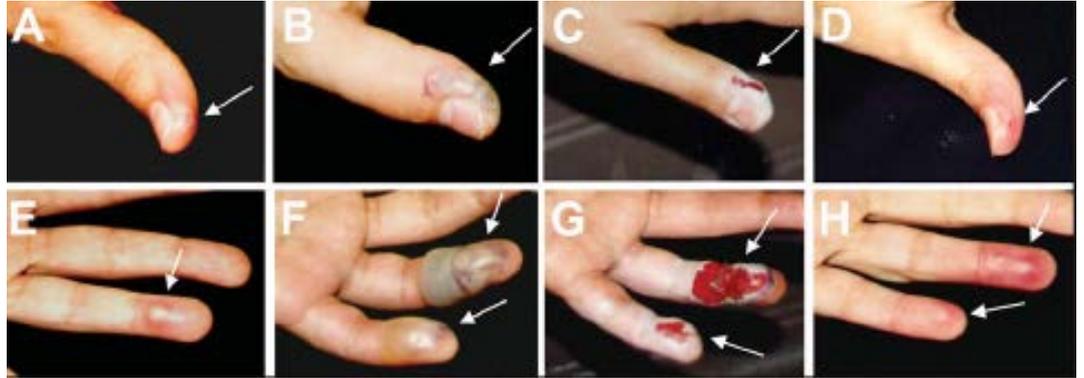
Occupational Exposures

- Diagnostic laboratorians directly handle specimens from persons with suspect orthopoxvirus infections
- Research personnel use replication-competent orthopoxviruses in biomedical research
- Healthcare workers in U.S.
 - Administer *Vaccinia virus* vaccine to (e.g., to military personnel)
 - Would treat patients with smallpox or monkeypox due to accidental or intentional exposures

Serious Infections Have Occurred During Laboratory and Research Work



Ocular vaccinia in laboratory worker



Needlestick inoculation of researcher using Vaccinia Virus as a vector

- Vaccination with an Orthopoxvirus vaccine can prevent these infections

Vaccinia Virus Vaccine Prevents Other Orthopoxvirus Infections

- Provides cross-protective immunity against other orthopoxviruses
- Facilitated smallpox eradication as main component of smallpox vaccine
- Recommended by ACIP for use in laboratory and healthcare personnel at risk for occupational exposure to orthopoxviruses

Morbidity and Mortality Weekly Report

Use of Vaccinia Virus Smallpox Vaccine in Laboratory and Health Care Personnel at Risk for Occupational Exposure to Orthopoxviruses — Recommendations of the Advisory Committee on Immunization Practices (ACIP), 2015

Brett W. Petersen, MD¹; Tiara J. Harms, MS, MPH²; Mary G. Reynolds, PhD¹; Lee H. Harrison, MD^{3,4}

Timeline of Vaccinia Virus Vaccines Licensed When ACIP Recommendations Were Made



Timeline of Vaccinia Virus Vaccines Licensed at Time of ACIP Recommendations

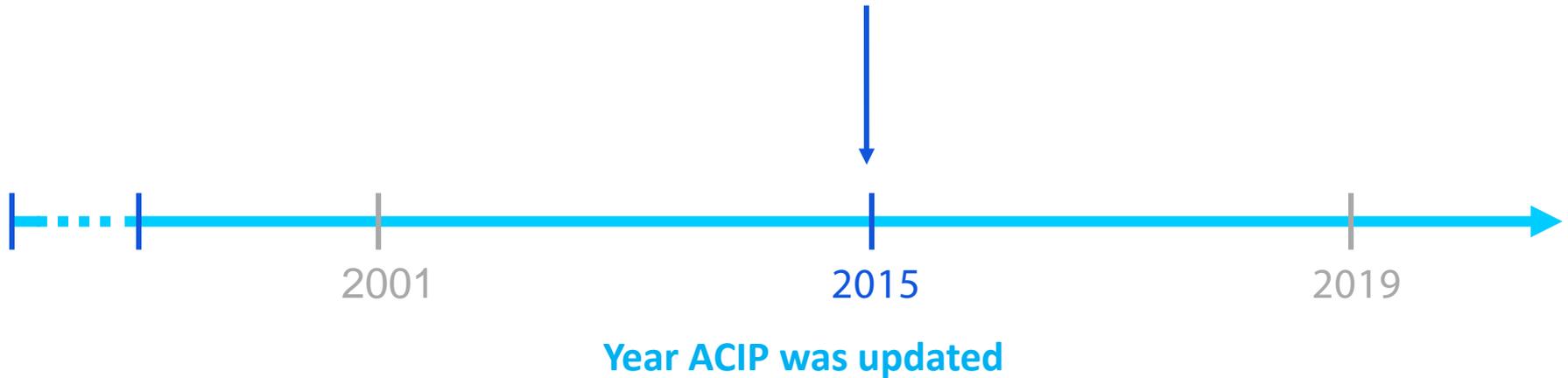
First generation / Dryvax®
(Wyeth Laboratories, Inc.)
Propagated in calf skin



Year ACIP was updated

Timeline of Vaccinia Virus Vaccines Licensed at Time of ACIP Recommendations

Second generation vaccine / ACAM2000™
(Acambis, Inc.™) had replaced Dryvax®
Propagated in tissue culture



Timeline of Vaccinia Virus Vaccines Licensed at Time of ACIP Recommendations

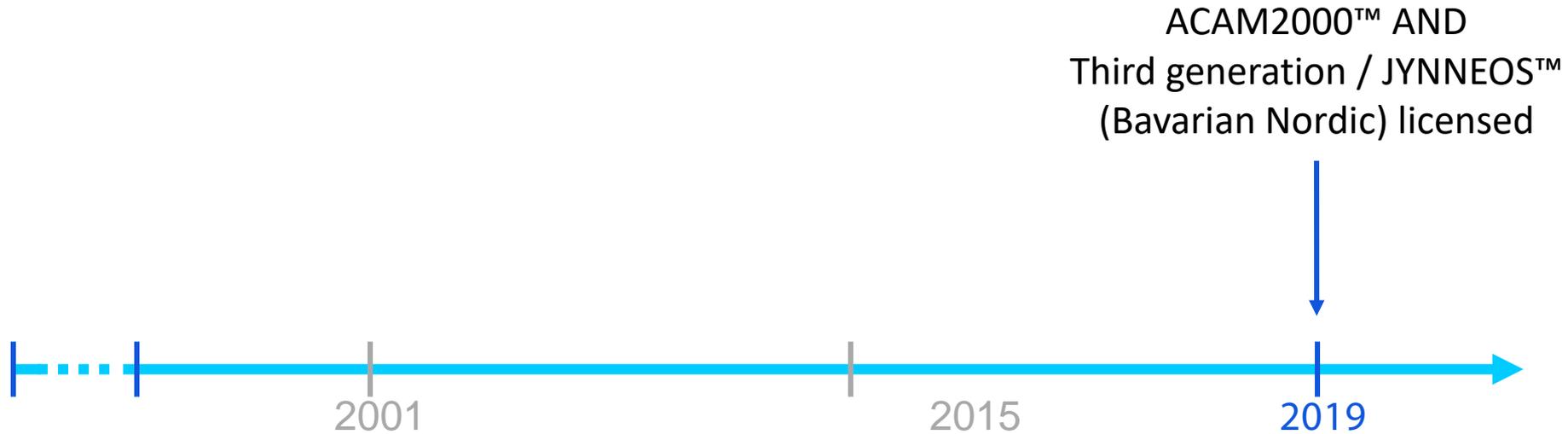
ACAM2000™

- Purified clone of strain used to make Dryvax®
- Safety Profile similar to that of Dryvax®

Second generation vaccine / ACAM2000™
(Acambis, Inc.™) had replaced Dryvax®
Propagated in tissue culture



Timeline of Vaccinia Virus Vaccines Licensed at Time of ACIP Recommendations



Timeline of Vaccinia Virus Vaccines Licensed at Time of ACIP Recommendations

JYNNEOS™

- Attenuated, live, replication deficient vaccinia virus
- Licensed in September 2019
- Can be used in persons for whom ACAM2000™ is contraindicated

ACAM2000™ AND
JYNNEOS™ (Bavarian Nordic)
licensed



Reason for Work Group

Update ACIP recommendations for use of JYNNEOS™ to prevent orthopoxviruses in persons at risk for occupational exposure

Work Group Activities

- Review available data about safety and effectiveness of JYNNEOS™, including among persons with atopic dermatitis, immunocompromising conditions, and pregnancy.
- Consolidate U.S. recommendations for vaccination of persons who may have occupational exposures to orthopoxviruses.
- Identify areas in need of further research for informing potential future vaccine recommendations to prevent *Orthopoxvirus* infection

Tentative Timeline (Subject to Change)



ACIP Work Group Co-Leads

Medical Officers, CDC Poxvirus and Rabies Branch

- Agam Rao, MD
- Brett Petersen, MD MPH

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Next Steps:

- Identify work group members
- Begin review of data and work group meetings

Thank you!

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

