



Monkeypox: Clinical Overview

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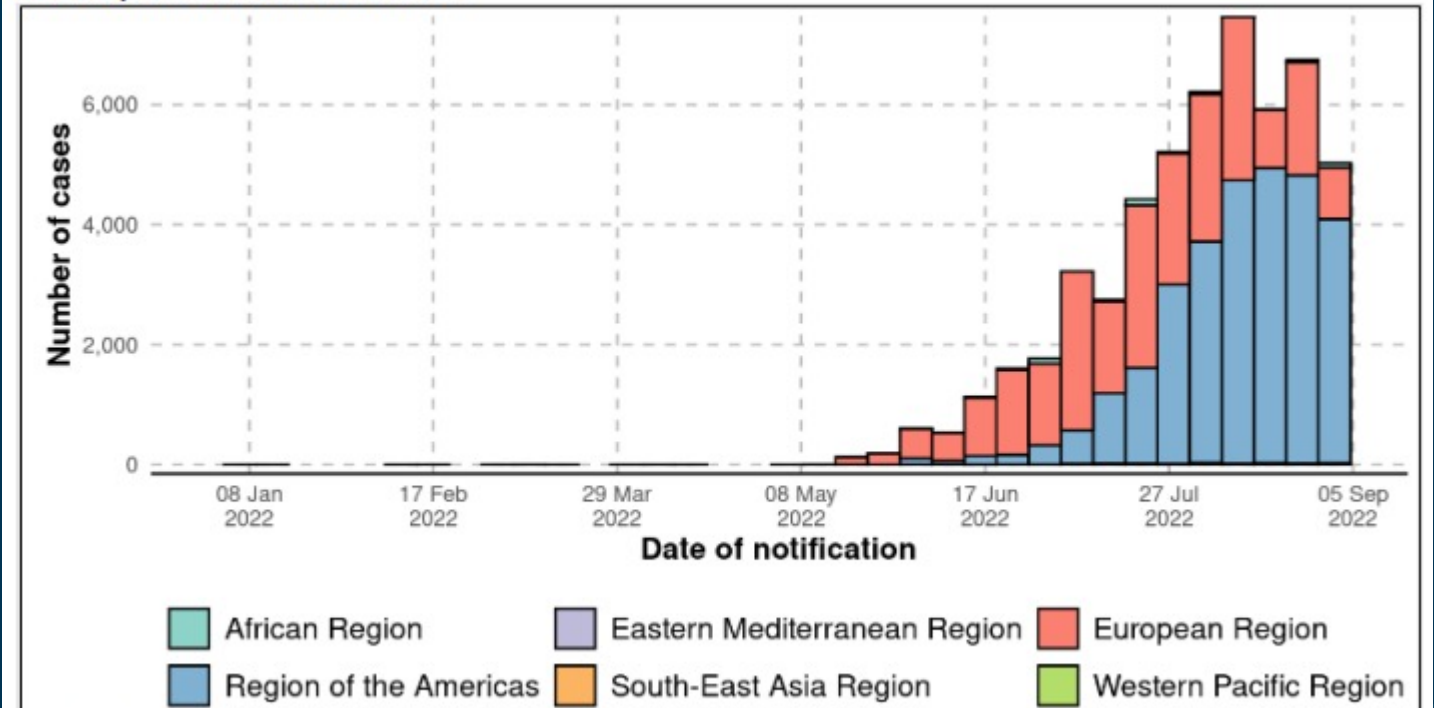
History & Epidemiology

- First human case in 1970
- Endemic in several African countries
 - Outbreaks have occurred sporadically around the world, including the US – almost always travel-related
- The source of the virus is not well known (not monkeys) – possibly African rodents or other non-human primates
- Two clades responsible for disease: Clade I and Clade II
 - Infections in the current outbreak are due to Clade II
 - Clade II infections are generally less severe than Clade I

Current monkeypox situation, worldwide

- More than **53,000 cases reported worldwide**
 - Highest number of reported cases in US
- Cases currently flattening or decreasing in many regions

Figure 1. Epidemiological curve of weekly aggregated confirmed cases of monkeypox by region, from 1 January to 04 September 2022 17:00 CEST*.



*This figure shows aggregated weekly data, for completed epidemiological weeks ending on Sundays. Data on the current week will be presented in the next situation report.

Transmission

- **Person-to-person** via direct contact (including intimate contact)
 - Includes contact with lesions, scabs, and/or body fluids
 - Capable of spreading until the rash is healed
 - Role of asymptomatic transmission? Possible transmission, but not well understood
- **Contact with fomites** and infectious surfaces, such as clothing, sheets, etc.
- **Respiratory secretions**
 - From prolonged face-to-face contact (e.g., kissing, etc.)
 - Less common route of transmission
- Is monkeypox a sexually transmitted disease?
 - Monkeypox can spread via close physical contact, such as sex, but insufficient evidence of transmission through genital fluids
- Can animals/pets harbor monkeypox?
 - Yes – all mammals should be considered susceptible to monkeypox and capable of becoming infected

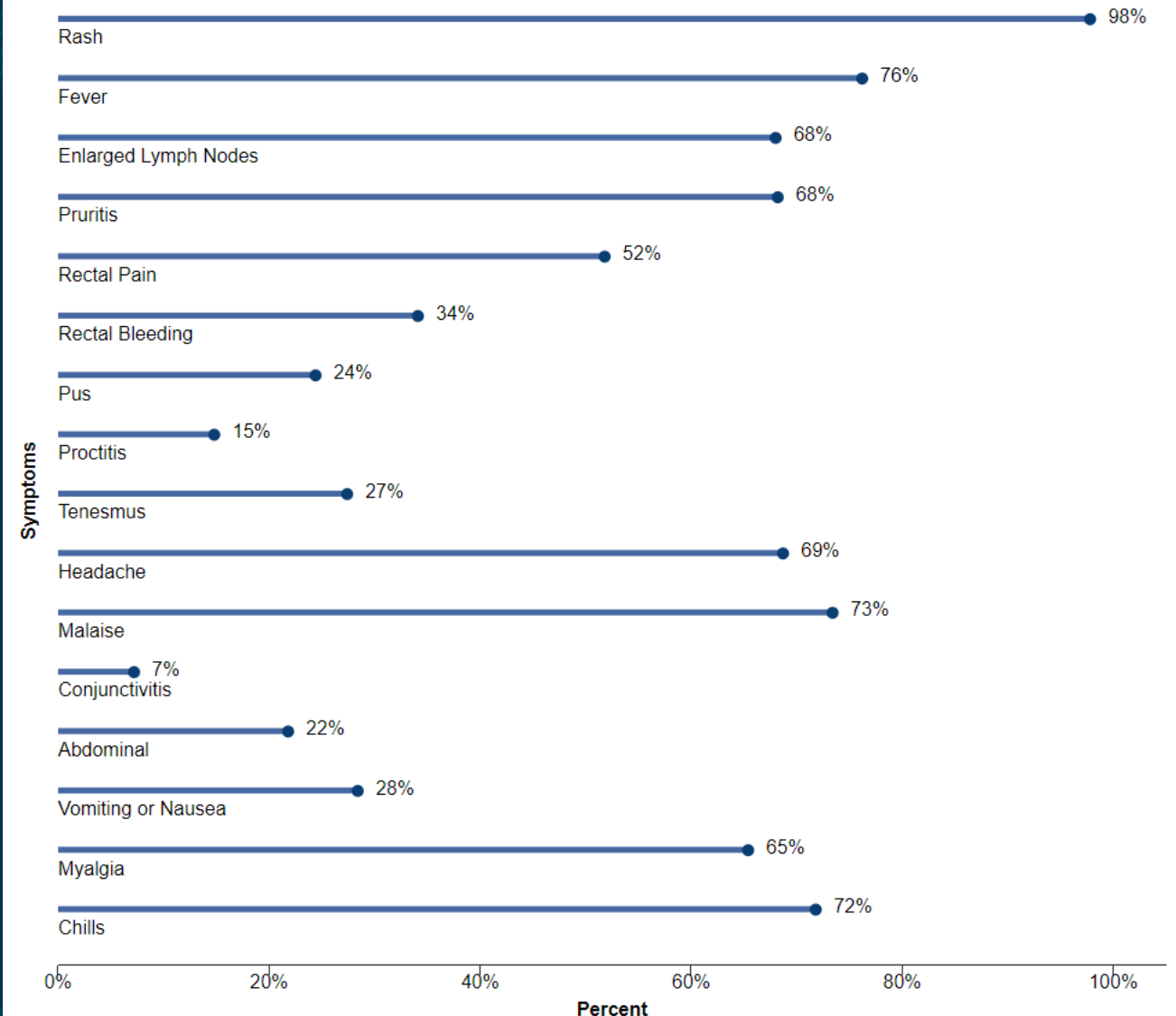
Signs and Symptoms

- **Incubation period:** 3 to 17 days
- **Classic:** prodromal symptoms (fever, lymphadenopathy, flu-like illness) followed by a characteristic rash (lesions at same stage)
- **Current outbreak:** mix of classic presentation plus atypical features
 - Rash often in genital or perianal regions, may be minimal pox present
 - Often confused with other infections (syphilis, HSV, etc.)
 - Prodromal symptoms may be mild or absent
- **Duration of symptoms** ranges from 2-4 weeks
- Most disease is mild; hospitalization and death are rare, even in immunocompromised hosts

Reported symptoms

- Per recent NEJM report:
 - **528 infections** diagnosed 4/27 to 6/24 at 43 sites in 16 countries
 - Cases predominantly seen among gay, bisexual men (98%)
 - Transmission likely occurred through sexual activity (95%)
 - **95% of the persons presented with a rash** (64% having ≤ 10 lesions), 73% had anogenital lesions, and 41% had mucosal lesions (with 54 having a single genital lesion)

Monkeypox cases reported to CDC: Symptoms



Monkeypox: images



Source: [NYTimes.com](https://www.nytimes.com)



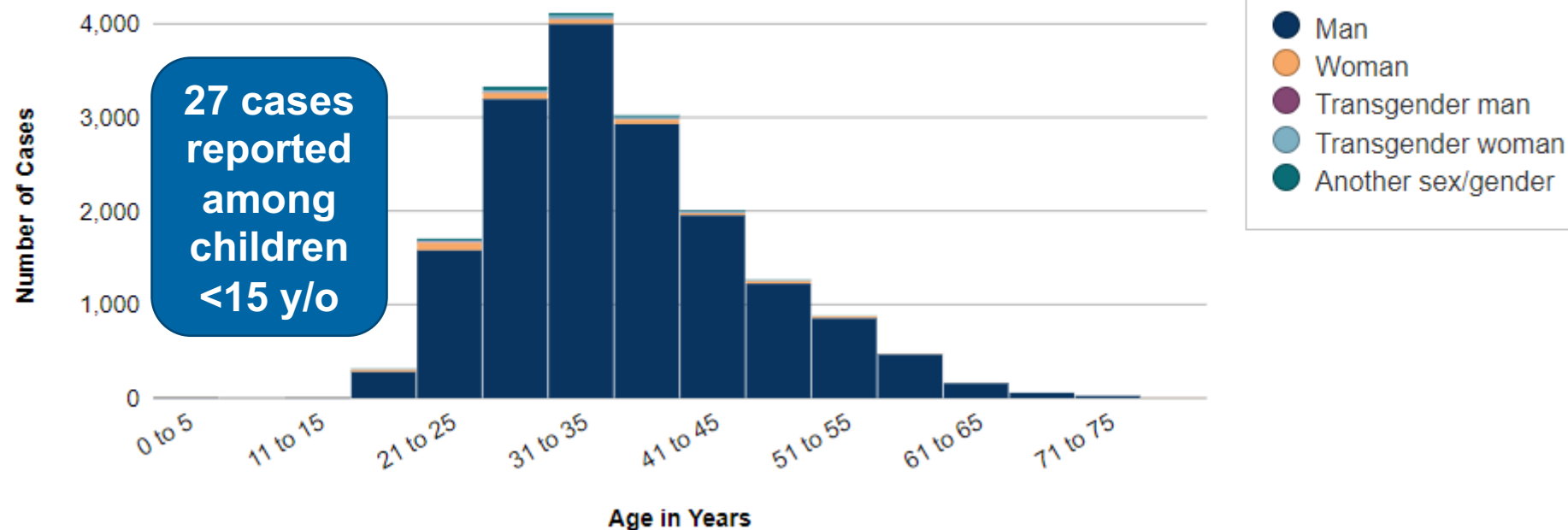
Source: [New York Post](https://www.nypost.com)



Source: [statnews.com](https://www.statnews.com)

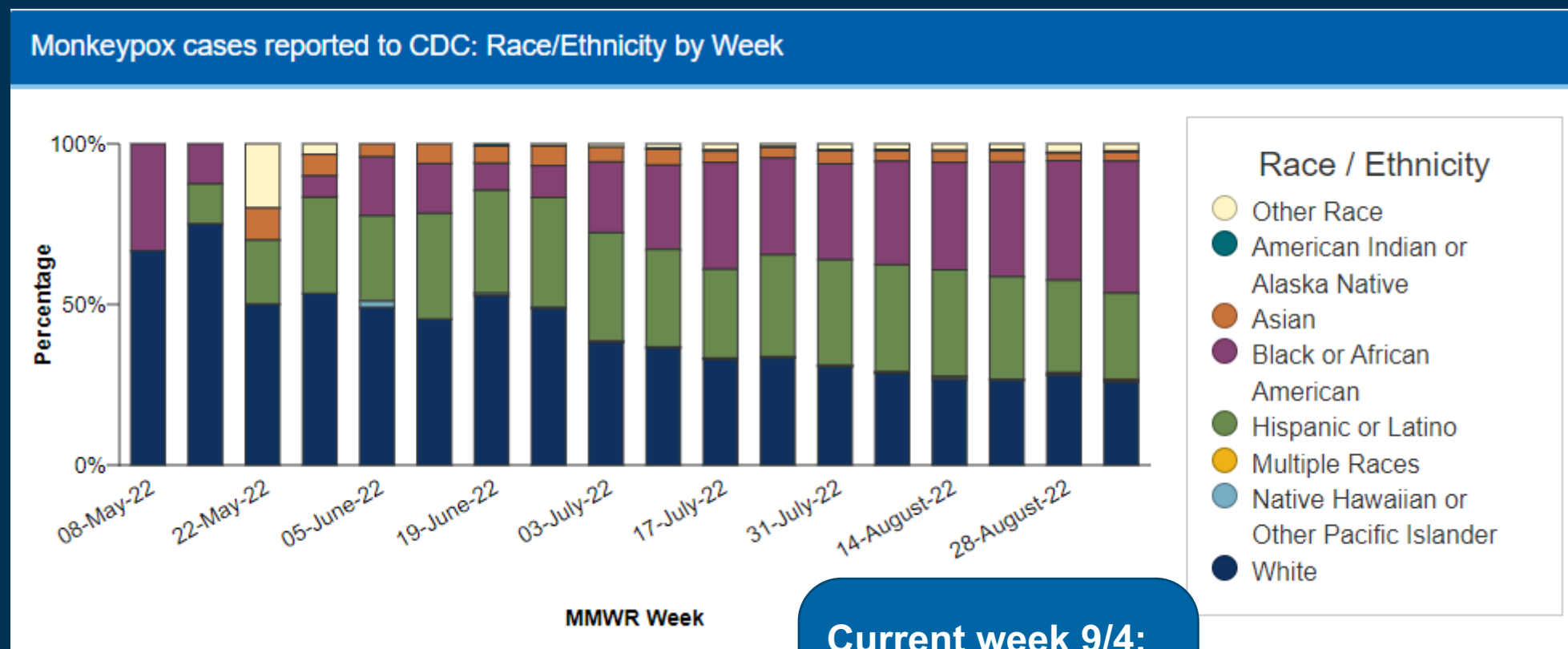
Current cases by age/gender, USA

Monkeypox cases reported to CDC: Age and Gender



23,893 total confirmed monkeypox/orthopoxvirus cases as of September 19

Current cases by race/ethnicity (weekly), USA

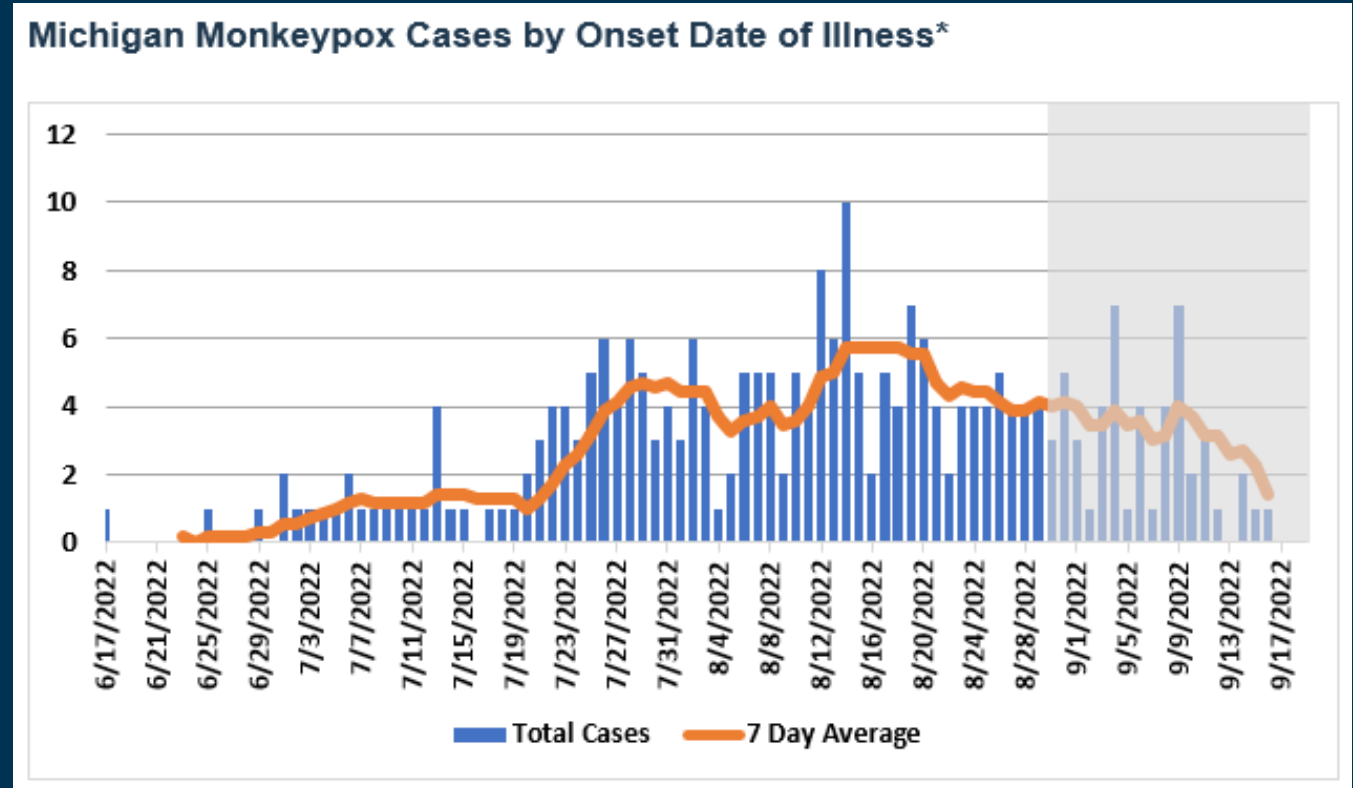


Current week 9/4:

41% Black
27% Hispanic
26% White

Current cases by onset date, MI

- **Confirmed cases as of 9/20: 257**
- 60% Age 25-39
- 98% Male
- 59% Black, 35% White
- 91% MSM
- 54% HIV positive



Infection Prevention

- **Hand hygiene**
- **Patient placement:** single private room with door closed
 - Special air handling not required
- **Wear appropriate PPE** when with the patient (including while collecting specimens for suspected cases)
 - Gown, gloves, eye protection, N95 or higher respirator
- **Standard cleaning and disinfection** practices
- **Patients isolating at home** should avoid contact with others including pets
 - Keep rash covered to avoid contamination of surfaces
- **Duration of precautions:** until infection is ruled out, or until all lesions have healed (2-4 weeks)

Diagnosis

- Swab of lesion or scab for PCR testing = gold standard
 - Sample collection may vary somewhat based on lab standards – contact your reference lab or local health department if questions on how to collect an adequate specimen
- Results usually available within 1-4 days

Treatment: whom to treat

- Consider treatment for the following:
 - People with **severe disease** (hospitalization, sepsis, encephalitis, etc.)
 - People with **risk of progression to severe disease** (immunocompromised hosts, children < 8 y/o, pregnant women, people with other disease complications)
 - People with monkeypox in areas that may constitute a **special hazard**, or may increase transmission risk to others (genitals, anus)

Treatment

- **Tecovirimat (TPOXX)**
 - May shorten duration of illness/shedding, decrease mortality
 - FDA-approved for smallpox, available for monkeypox treatment via IND protocol
 - 2-week course of treatment available PO or IV
 - Low risk of adverse events: most common are headache and nausea
- **Other treatment options** (limited data on efficacy):
 - Vaccinia immune globulin, Cidofovir, Brincidofovir
- Median age of patients receiving TPOXX = 35.7 years

Vaccination (PEP/PrEP)

- JYNNEOS and ACAM2000 are the two vaccines that may be used for the prevention of monkeypox disease
- **JYNNEOS:**
 - Live, replication-deficient Vaccinia vaccine (cannot cause monkeypox or smallpox)
 - 2-dose series given at day 0, 28; given subcutaneously or intradermally
 - Peak immunity after 2 weeks, duration of protection unknown
 - Efficacy: “about 85%,” but data lacking
 - AEs: most common include pain, redness, swelling at injection site
 - If given for PEP, should be given as soon as possible after known or high-risk exposure
- **ACAM2000:**
 - Single dose percutaneous administration – less widely available
- Does having smallpox vaccination years ago prevent monkeypox?
 - Not clear – may be some residual protection, but breakthrough cases of monkeypox have been reported in persons vaccinated against smallpox

Obtaining treatment or vaccine

- First, **determine patient eligibility**
- Next, **contact your local health department**
 - Most have treatment or vaccine or both available and can help administer
- Alternatively, **check with your affiliated healthcare systems**
 - Many healthcare systems may have processes in place to obtain treatment and/or vaccine for PEP/PrEP
- IND forms required for treatment can be obtained on the CDC website and can be submitted after treatment begins



Thank You

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