

Public health response to monkeypox in Massachusetts

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Monkeypox

- Rare zoonotic infection
- Endemic in west and central Africa
- Caused by monkeypox virus
- Specific animal reservoir unknown, but likely small mammals

Outbreak history

- 1958 – identified in laboratory monkeys
- 1970 – DRC/Zaire: first human case
- 2003 – US outbreak: 71 cases, source = exotic animal trade
- 2017 – Nigeria outbreak: sexual transmission, international spread
- 2022 – Global outbreak: primarily men who have sex with men

Increasing incidence likely tied to decreasing herd immunity following discontinuation of routine smallpox vaccination (1972)

Transmission

- Can spread from person-to-person
 - Intimate skin-to-skin contact
 - Lesions
 - Infected body fluids (e.g., fluid from vesicles and pustules)
 - Fomites (e.g., shared towels, contaminated bedding)
 - Respiratory secretions
- 21-day incubation period

Clinical hallmark = rash

- Classic evolution: maculopapular → papules → vesicles → scabs
 - All contain viable virus
- Appearance can be protean
- Develops at sites of skin contact with infected lesion
 - Anogenital >70%
 - Mucosal >40%
- Auto-inoculation possible



Clinical manifestations

- Nonspecific prodrome: fever, malaise, sore throat, LAD
- Lesions are painful !! → proctitis, dysuria, pharyngitis
 - Pain control: sitz baths, topical lidocaine, NSAIDS, gabapentin, opiates
- Uncommon complications: encephalitis, cellulitis, pneumonia, sepsis, abscess, keratitis
- Death is rare (one death in US to date)

2022 Multinational Monkeypox Outbreak

- WHO public health emergency declared 7/23/22
- CDC public health emergency declared 8/4/22

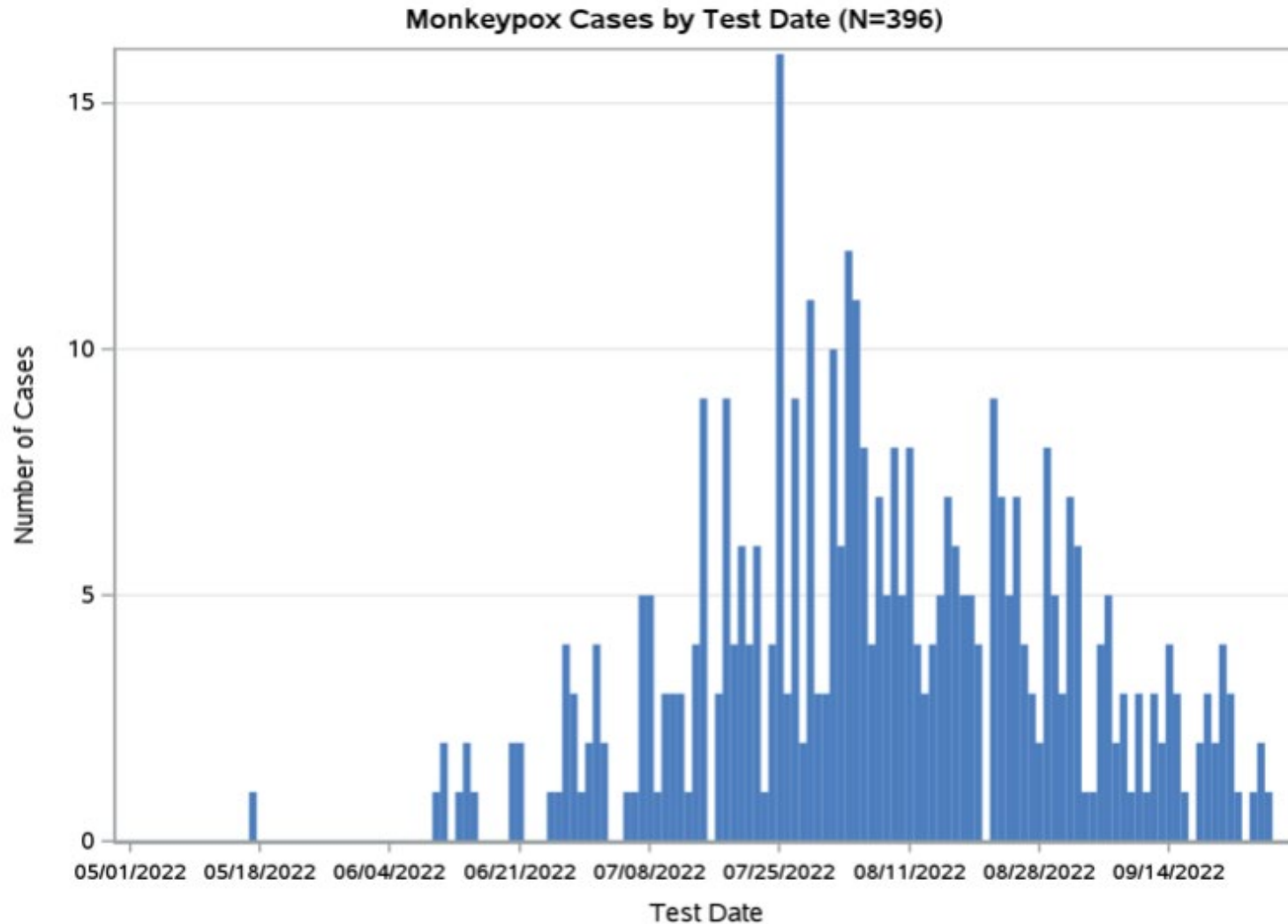
Burden (9/29/22)

- Global: 68,799 confirmed cases (106 countries)
- US: 25,612 cases – highest count among all countries
- MA: 396 cases (9/29/22)

**First US MPX
case reported
on 5/18/22 at
Massachusetts
General
Hospital**

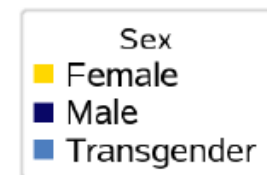
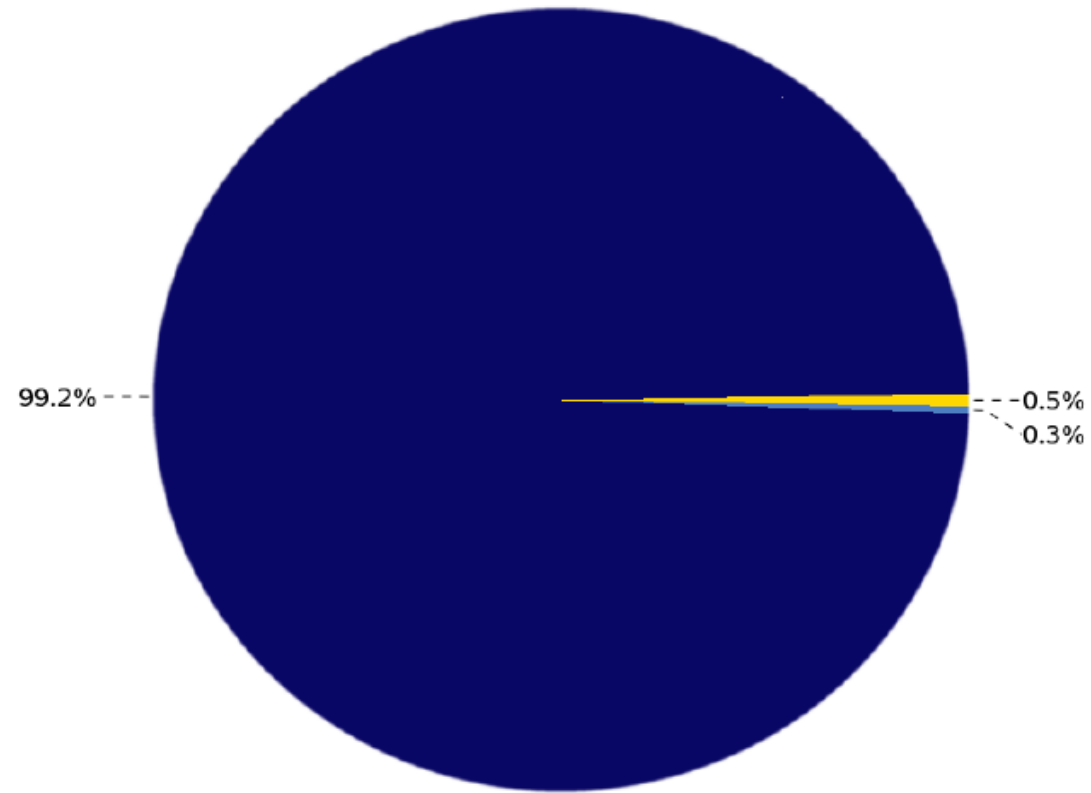


Monkeypox incidence in MA – 9/29/22

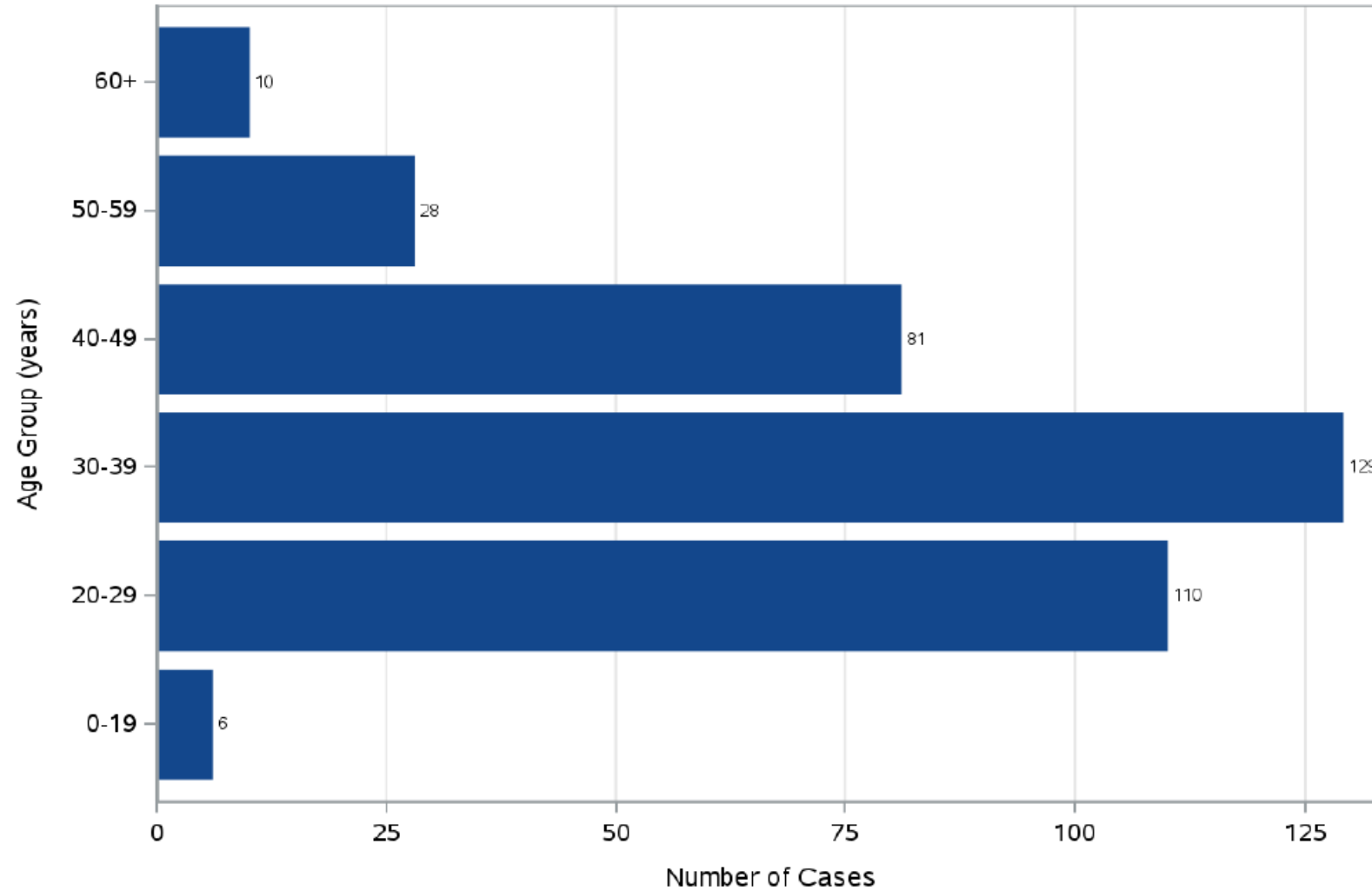


Data as of 09/29/2022 and subject to change.

Monkeypox cases in MA by sex

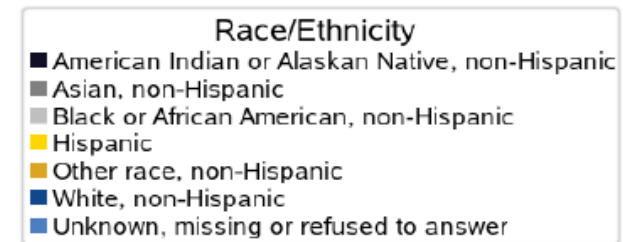
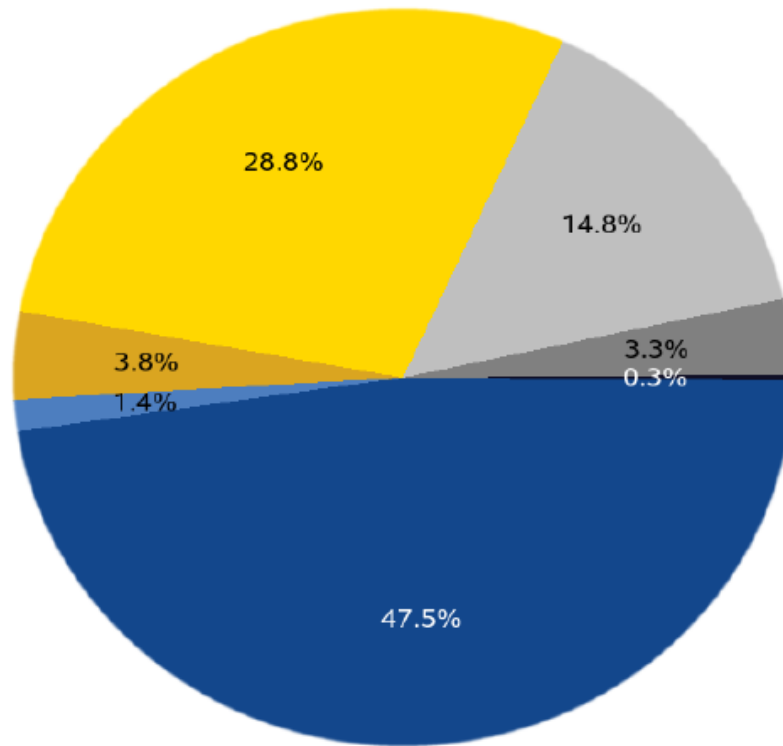


Monkeypox cases in MA by age group



Data as of 09/15/2022 and subject to change.

Monkeypox cases in MA by race/ethnicity



Monkeypox and other STIs

- CDC: people with monkeypox (n = 1969) have higher than expected rates of HIV
 - 38% living with HIV
 - HIV prevalence higher in older age groups
 - 59% in age >55 years
 - Black and Hispanic with higher HIV compared to White and Asian
 - People with monkeypox and HIV coinfection hospitalized more often than people without HIV infection
 - 41% with at least one reportable STI in the past year

Testing for monkeypox

Indications for testing

1. Close contact with known case
2. Close contact with individual with compatible rash
3. MSM or transgendered man with high-risk proximate contact
4. Residence or travel in endemic area

How to test

1. Dry swab of a lesion for presence of monkeypox virus
2. Nucleic acid amplification test

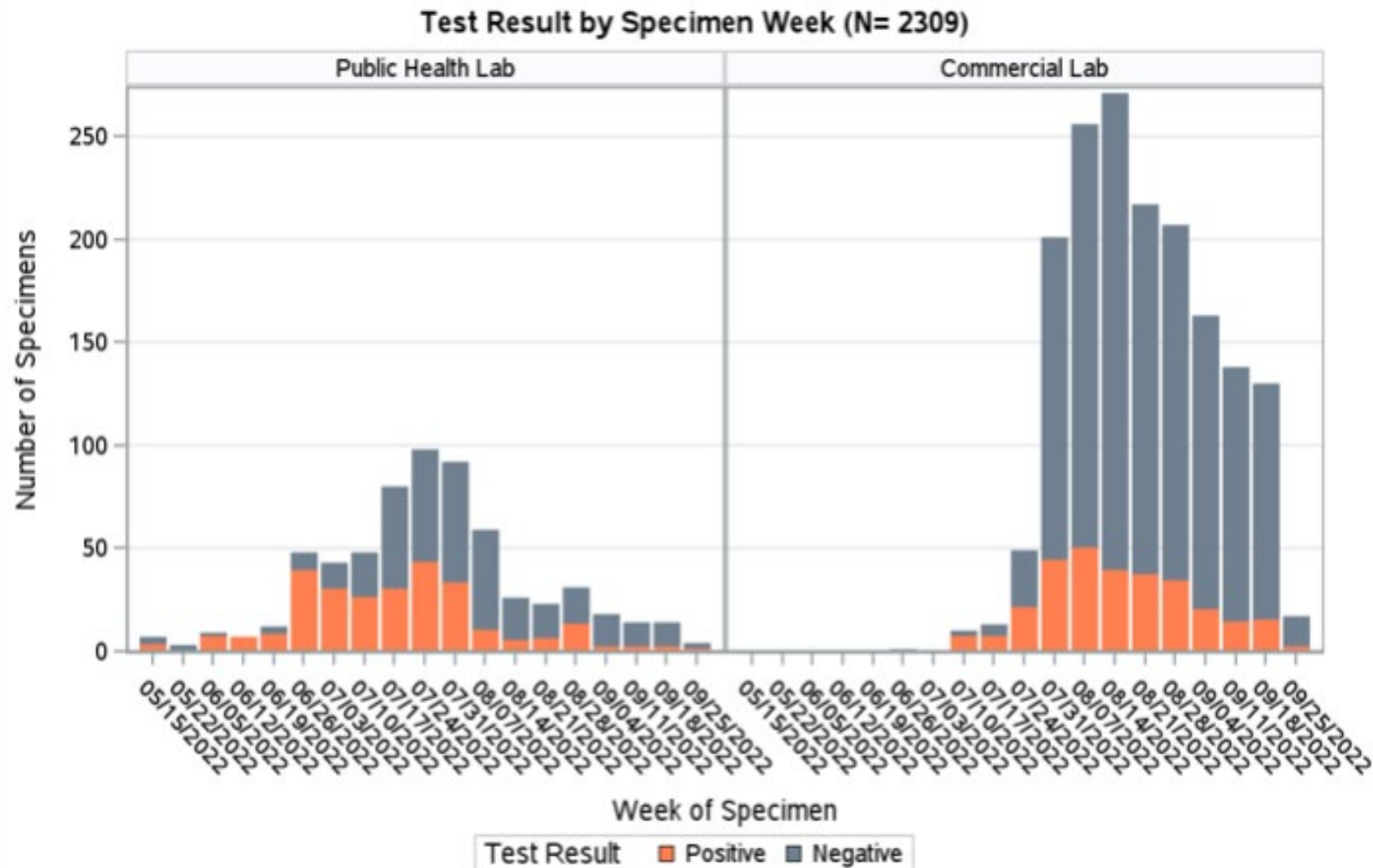
Note: Clinicians should also rule out more common causes of rash illness while considering monkeypox.

- herpes, secondary syphilis, chancroid, varicella-zoster virus

Testing

- Testing available via commercial labs (Aegis, Labcorp, Mayo, Quest, Sonic)
- Testing available at SPHL without preapproval for individuals with high pre-test probability
 - Clinically compatible patients with a **known risk factor**; OR
 - Patients for whom there is a strong clinical suspicion of monkeypox who are **hospitalized**; OR
 - Patients for whom there is a strong clinical suspicion of monkeypox and are at **high risk of more severe disease**; OR
 - Patients for whom there is a strong clinical suspicion of monkeypox in a **congregate setting**; OR
 - Patients for whom **cost of commercial testing is a concern**.

Monkeypox testing usage



Lab data represents specimens tested, not patients. Most patients have multiple specimens tested.

CDC Exposure Risk - Healthcare

	Characteristics	Monitoring	PEP
High	<ul style="list-style-type: none">• Unprotected contact between skin and infected lesion, skin, fomite• Exposure to aerosols without N95	Yes	Yes
Intermediate	<ul style="list-style-type: none">• Within 6 ft of unmasked patient for >3 hrs• Contact between clothing (no gown) and infected skin, lesion fomite	Yes	Yes (risk v benefit)
Low	<ul style="list-style-type: none">• Within 6 ft of unmasked patient for < 3 hrs	Yes	No
No		No	No

Infection control

Isolation:

- Until all lesions are resolved (healthy intact skin at previous lesion site)
- Lesions should remain covered (and individual should remain masked) in public if strict isolation not possible

Precautions: enhanced respiratory (N95 recommended)

FDA-approved orthopox vaccines

- Jynneos
 - Live, attenuated, nonreplicating vaccinia
 - Intradermal or subcutaneous, two doses, 28 days apart
 - Well tolerated
 - Safe for immunocompromised
- ACAM2000
 - Live, replication-competent, vaccinia virus
 - Percutaneous, multipuncture single dose
 - “Take” lesion; side effects (pain, fever, LAD, myocarditis/pericarditis)
 - Contraindicated in immunosuppressed

Vaccination strategy

Expanded post exposure prophylaxis(PEP++)

- People who are **known contacts to someone with monkeypox** who are identified by public health authorities
- People who are aware that a **recent sex partner within the past 14 days was diagnosed with monkeypox**
- Certain gay, bisexual, or other men who have sex with men, or transgender or nonbinary people, who have had any of the following within the past 14 days: **sex with multiple partners (or group sex); sex at a commercial sex venue; or sex in association with an event, venue, or defined geographic area where monkeypox transmission is occurring**

CDC pre-exposure prophylaxis guidance

- Gay, bisexual, and other men who have sex with men, transgender or nonbinary people who in the past 6 months have had
 - A new diagnosis of one or more nationally reportable sexually transmitted diseases (i.e., acute HIV, chancroid, chlamydia, gonorrhea, or syphilis)
 - More than one sex partner
- People who have had any of the following in the past 6 months:
 - Sex at a commercial sex venue
 - Sex in association with a large public event in a geographic area where monkeypox transmission is occurring
- Sexual partners of people with the above risks
- People who anticipate experiencing the above risk

Jynneos roll out in Massachusetts

- Doses administered in MA (9/29/22): 27,119
 - 17,784 individuals vaccinated
- Phase I (7/5/22) – high volume health care providers in high burden communities: OCHS, MGH SHC, BMC, FH
- Phase II (7/13/22) – geographic and equity-based expansion: Cambridge, Dorchester, Framingham, Lawrence, New Bedford, Randolph, Springfield, Worcester plus mobile vax unit
- Doses of Jynneos are available for any health care facility to manage a high-risk contact on an **as-needed basis**

Monkeypox treatment = tecovirimat (TPOXX)

- First drug approved by the FDA that is specifically indicated for the treatment of smallpox disease in adults and pediatric patients weighing at least 13 kg
- Developed through Project BioShield; held at the Strategic National Stockpile (two million doses)

Tecovirimat efficacy

- Inhibits the function of a major orthopox envelope protein (VP37) required for production of extracellular virus → blocks cellular transmission of virus
- Animal studies of lethal monkeypox exposure show improved survival compared to placebo
- No human efficacy studies
- Anecdotal reports of faster resolution of lesions, decreased pain

Tecovirimat indications

- Severe disease
 - Hemorrhagic disease, confluent lesions, encephalitis
- Risk for severe disease
 - HIV or other immunocompromise
 - Pregnancy
 - Atopic dermatitis or other exfoliative skin conditions
 - Children
- Complications
 - Bacterial superinfection, gastroenteritis, bronchopneumonia
- Lesions in a sensitive anatomic site
 - Anogenital lesions, ocular lesions

Tecovirmat

- Dosage: 600 mg (three 200 mg caps) BID x 14 days
- 600mg TID if weight >120kg
- Well tolerated
- Contraindicated in severe renal impairment (GFR < 30)
- No hepatic dose adjustment required
- Minimal drug-drug interactions
- IV formulation available

Access to tecovirimat

- Available under Early Access-Investigational New Drug (EA-IND)
- Healthcare facility application
 - FDA 1572 (one per facility)
 - Informed consent and patient intake form (one per patient)
- DPH hold the state supply; distributes courses as needed (through healthcare facility pharmacies)
- Ordering: <https://www.mass.gov/info-details/obtaining-and-using-tpoxx>
- Treatment tracking via REDCap

Additional concerns

- Need for social supports for individuals with monkeypox
- Further stigmatization of MSM and transgendered men
- Equity of access to vaccination, testing, treatment
- Simmering STI?



150 YEARS
OF ADVANCING
PUBLIC
HEALTH

Massachusetts Department of Public Health

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