SFDPH Monkeypox Update for Clinicians

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Disclosure & Disclaimers

Disclosures: none

Disclaimer: We are still in the early stages of the 2022 Monkeypox outbreak in San Francisco. Although we know more, and can do more, about the disease, than even a month ago, we still have much to learn. Some of the information on these slides will be out of date by the time you see them.

View expressed in these slides are the presenter’s and do not necessarily reflect those of the SFDPH
Roadmap

1. Background
2. Epidemiology: global, national, local
3. “Canonical” disease transmission and presentation (pre-2022)
4. What’s different about the 2022 outbreak
5. Diagnosis and testing
6. Treatment
7. Vaccines and prevention
8. Infection control
Background
Monkeypox (MPX) basics

- Orthopox virus, related to smallpox (variola)
  - Generally, much less severe, self-limited
  - Mortality 1-11% (MPX) vs 30% (variola)
    - Young, elderly
    - Encephalitis, pneumonitis
    - Sepsis (confluent lesions)
    - Congo basin strain >West African strain

- 1st discovered in 1958
  - Outbreaks in monkeys kept for research

- 1st human case in 1970 (DRC)

- Endemic in some parts of the world
  - West & Central Africa

- Natural reservoir: unknown
  - African rodents & non-human primates may harbor virus & infect humans

- MPX cases in non-endemic countries have also occurred sporadically, linked to international travel or imported animals (USA 2003)
Epidemiology of the 2022 MPX outbreak
Total confirmed monkeypox/orthopoxvirus cases: 3,487

*One Florida case is listed here but included in the United Kingdom case counts because the individual was tested while in the UK.

- Total US: 3,487
- Total CA: 356
- Total SF: 141 (7/19) → 222 as of 7/26/22

Data sources:
https://map.monkeypox.global.health/country
https://www.cdc.gov/poxvirus/monkeypox/response/2022/world-map.html
Monkeypox 2022 global epidemiology; Report 2022-06-17
<table>
<thead>
<tr>
<th>Race/ethnicity</th>
<th>% of total MPX cases</th>
<th>% of SF Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian/Alaska Native</td>
<td>0%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Asian</td>
<td>5.8%</td>
<td>33.9%</td>
</tr>
<tr>
<td>Black/African-American</td>
<td>7.0%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Hispanic or Latinx, all races</td>
<td>29.1%</td>
<td>15.3%</td>
</tr>
<tr>
<td>Native Hawaiian/Pacific Islander</td>
<td>0%</td>
<td>0.3%</td>
</tr>
<tr>
<td>White</td>
<td>47.7%</td>
<td>40.7%</td>
</tr>
<tr>
<td>Other/Multi</td>
<td>2.3%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Unknown</td>
<td>8.1%</td>
<td></td>
</tr>
</tbody>
</table>

Data as of July 18, 2022
## SF Monkeypox Demographics – Sexual Orientation

<table>
<thead>
<tr>
<th>Sexual Orientation</th>
<th>% of Total MPX Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heterosexual/Straight</td>
<td>1.2%</td>
</tr>
<tr>
<td>Gay, Lesbian, or same-gender loving</td>
<td>88.4%</td>
</tr>
<tr>
<td>Bisexual</td>
<td>1.2%</td>
</tr>
<tr>
<td>Other</td>
<td>0.0%</td>
</tr>
<tr>
<td>Unsure</td>
<td>0.0%</td>
</tr>
<tr>
<td>Declined</td>
<td>0.0%</td>
</tr>
<tr>
<td>Unknown</td>
<td>9.3%</td>
</tr>
</tbody>
</table>

Data as of July 18, 2022
# Monkeypox Cases – Diagnosing Clinic

<table>
<thead>
<tr>
<th>Race/ethnicity</th>
<th>% of total MPX cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF City Clinic</td>
<td>23.9%</td>
</tr>
<tr>
<td>Kaiser SF</td>
<td>22.3%</td>
</tr>
<tr>
<td>One Medical</td>
<td>19.6%</td>
</tr>
<tr>
<td>SF AIDS Foundation (Strut)</td>
<td>10.9%</td>
</tr>
<tr>
<td>ZSFG Urgent Care</td>
<td>6.5%</td>
</tr>
<tr>
<td>Ward 86</td>
<td>3.8%</td>
</tr>
<tr>
<td>CPMC/Sutter</td>
<td>3.8%</td>
</tr>
<tr>
<td>UCSF</td>
<td>3.3%</td>
</tr>
</tbody>
</table>

Other sites include: Chinese Hospital, Go Health, MNHC, St. Francis/St. Mary’s
Transmission and clinical disease
MPX transmission, pre-2022

• Mostly rodent → human
• Human → human spread less common, often within households
  • Direct contact with infectious lesions
  • Prolonged contact with respiratory secretions/droplets during infectious period
  • Fomites (sheets, towels, clothing) that have been in contact with lesions
  • $R_0<1$, limited person-to-person transmission
First cases identified in UK, Portugal, Germany, Spain in mid-May ➔ Americas

• Almost entirely MSM or TGSM
• Initially associated with attendance at sex parties, raves, saunas, bathhouses in Europe, UK, or travel thereto
• Currently: community spread within MSM sexual networks, where $R_0$ may be higher
• Not associated with travel to historically endemic areas
• **STI clinics highly involved in diagnosing cases**
Case series of 528 infections 4/27-6/24 at 43 site in 16 countries: 16% in the Americas, 84% in Europe, Israel, Australia
98% GBMSM, 75% white, 41% PLWH, median age 38 years
Sexual transmission thought to occur in 95%; concomitant STIs in 109/377 (9%) of those tested; 5 median sex partners in last 3 mo (IQR 3-15); MPV DNA in seminal fluid of 29/32 persons analyzed
Mean incubation period 7 days (3-30)
Antiviral treatment: 5%
Hospitalizations: 70 (13%)
  Severe anal pain (21)
  SSTI superinfection (18)
  Infection control (13)
  Pharyngitis limiting PO intake (5)
  Eye lesions (2)

Source: Thornhill et al. for SHARE Collaborative. NEJM 21 July 2022
72% of cases diagnosed at STI, HIV clinics, ED; 74% without contact to known case

Table 3. Diagnosis and Clinical Characteristics of Monkeypox in the Case Series.*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>All Persons (N = 528)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical setting of presentation — no. (%)</td>
<td></td>
</tr>
<tr>
<td>Sexual health clinic</td>
<td>120 (23)</td>
</tr>
<tr>
<td>Emergency department</td>
<td>106 (20)</td>
</tr>
<tr>
<td>Primary care</td>
<td>20 (4)</td>
</tr>
<tr>
<td>Dermatology clinic</td>
<td>38 (7)</td>
</tr>
<tr>
<td>HIV clinic</td>
<td>154 (29)</td>
</tr>
<tr>
<td>Other hospital clinic</td>
<td>30 (6)</td>
</tr>
<tr>
<td>Private clinics or other</td>
<td>60 (11)</td>
</tr>
<tr>
<td>Suspected route of transmission — no. (%)</td>
<td></td>
</tr>
<tr>
<td>Sexual close contact</td>
<td>504 (95)</td>
</tr>
<tr>
<td>Nonsexual close contact</td>
<td>4 (1)</td>
</tr>
<tr>
<td>Other or unknown</td>
<td>17 (3)</td>
</tr>
<tr>
<td>Household contact</td>
<td>3 (1)</td>
</tr>
<tr>
<td>Contact with person known to have monkeypox — no. (%)</td>
<td>135 (26)</td>
</tr>
</tbody>
</table>

Source: Thornhill et al. for SHARE Collaborative. NEJM 21 July 2022
MPX Natural history: classical and 2022

What is different in 2022 outbreak?

• Prodrome may be absent, with limited adenopathy
• Skin lesions may be asynchronous
• Rash often starts in anogenital region then spreads to head, extremities
• Wide variability in number of lesions, locations, severity:
  • 1-5 lesions, confined to one area, that resolve
  • Explosive growth of painful lesions in multiple areas
  • Some patients develop morbilliform rash as well
Complications seen in patients diagnosed at or referred to SF City Clinic

- Proctitis: intensely painful, can be bloody, usually w/ perianal lesions
- Oropharyngeal sores, with tonsillitis, dysphagia
- In uncircumcised: extensive lesions on glans, under foreskin, with painful phimosis +/- urinary retention
- Conjunctivitis
- Morbilliform rash
- Hospitalizations for pain control, urinary retention
- No deaths, to date
Diagnosis, differential diagnosis, case definition, and testing
<table>
<thead>
<tr>
<th>Feature</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rash/Skin lesions</td>
<td></td>
</tr>
<tr>
<td>- anogenital</td>
<td>500 (95)</td>
</tr>
<tr>
<td>- anogenital only</td>
<td>383 (73)</td>
</tr>
<tr>
<td>- oropharyngeal only</td>
<td>148/217 (68)</td>
</tr>
<tr>
<td>- oropharyngeal only</td>
<td>50/217 (23)</td>
</tr>
<tr>
<td>- vesiculopustular</td>
<td>291 (58)</td>
</tr>
<tr>
<td>- ulcer(s)</td>
<td>149 (30)</td>
</tr>
<tr>
<td>Number of skin lesions</td>
<td></td>
</tr>
<tr>
<td>&lt;5</td>
<td>207 (39)</td>
</tr>
<tr>
<td>5-10</td>
<td>131 (25)</td>
</tr>
<tr>
<td>11-20</td>
<td>112 (21)</td>
</tr>
<tr>
<td>&gt;20</td>
<td>56 (11)</td>
</tr>
<tr>
<td>Fever</td>
<td>330 (62)</td>
</tr>
<tr>
<td>Lymphadenopathy</td>
<td>295 (56)</td>
</tr>
<tr>
<td>Pharyngitis</td>
<td>113 (21)</td>
</tr>
<tr>
<td>Headache</td>
<td>145 (27)</td>
</tr>
<tr>
<td>Myalgias</td>
<td>165 (31)</td>
</tr>
<tr>
<td>Proctitis/anorectal pain</td>
<td>75 (14)</td>
</tr>
<tr>
<td>Lethargy/exhaustion</td>
<td>216 (41)</td>
</tr>
</tbody>
</table>

Source: Thornhill et al. for SHARE Collaborative. NEJM 21 July 2022
MPX lesions - Penis

Source: John Brooks and Christy Hutson; CDC IDSA Webinar 7/23/22; Basgoz 2022 NEJM; Jang 2020 J Koren Med Šë; BW Furness
MPX in 2022: differential diagnosis

• Primary or secondary syphilis – EIA/RPR
• Genital herpes – NAAT for HSV 1 & 2
• Varicella Zoster
• Lymphogranuloma venerium (LGV)
• Proctitis (gonorrhea, chlamydia/LGV, or HSV) – GC/CT NAAT at all exposure sites
• Impetigo

• Patient may have MPX AND any of the above: test for all!
Who should get tested?

People with a suspicious rash AND:

• Contact to person with a similar rash or symptoms
  -or-
• Close or intimate contact with individuals in a network where monkeypox is spreading – this includes gay, bisexual, trans people, and men who have sex with men
  -or-
• Sex worker of any sexual orientation or gender identity
  -or-
• Traveled to an area where outbreaks are occurring
Sampling suspected MPX lesions for testing

• Specimen type
  • Skin lesion material (consult specific lab for acceptable specimen type)

• Collection
  • 2 sterile synthetic swabs per lesion
  • Swab lesion vigorously to collect adequate DNA but do not need to unroof
  • 3 lesions per patient recommended by CDC but at SFCC we are doing 1-2 to reduce lab burden
  • Place swabs in dry sterile container vs VTM PER LAB REQUIREMENTS

• Labs (SF): Quest, LabCorp, SFDPH PHL
MPX testing options in SF

• DPH facility using SF Public Health Lab (PHL)
  • In EPIC order “Orthopox/Monkeypox virus PCR” test

• Non-DPH facility using SF PHL
  • Log in to the Apollo Portal
  • If you don’t have an Apollo log in, email brian.feraru@sfdph.org

• Any facility using a commercial lab
  • Testing now available through LabCorp, Quest, and other reference labs
  • Check with lab regarding submission forms and ordering instructions
Monkeypox Testing Through SFPHL

Order labs

• DPH facility - Order "Orthopox/Monkeypox virus PCR" in EPIC (must be part of DPH EPIC)
• Non-DPH facility – Order through Apollo portal
  • If your facility needs Apollo login, email Brian.Feraru@sfdph.org
  • Paper requisitions are only accepted for first-time submitters
  • One order per lesion site

Collect swabs

• VTM (preferred) or dry swab in clearly labelled tubes
  • No urine cups, do not force swab into tube
  • Select up to 2 lesions, perform 2 swabs per lesion
  • If able, careful unroofing with a sterile needle may improve test results
  • One tube per bag, stored in fridge for up to 72hrs

Bring to PHL

• Facilities with a courier are asked to deliver specimens to PHL (101 Grove, Suite 412) Mon-Fri 8-5
• If courier support is needed, please email monkypox@sfdph.org to schedule a pick-up

Results

• Available within 2-3 business days (uploaded directly into EPIC or Apollo)
• Provider is responsible for disclosing results and coordinating follow-up care as needed, including support with determining end of isolation
Report all suspect MPX cases

• Report within 1 working day using CMR form
  (https://www.sfcdcp.org/communicable-disease/disease-reporting/)
• Write “suspect monkeypox” in the disease being reported field
• Email form to: monkeypox@sfdph.org
  Or
• Fax to: (415) 554-2830
Treatment: symptom management and antivirals
Monkeypox Treatment

Most individuals:

• Initially mild, self-limiting disease course without treatment
• Clinical experience: patients with initially limited disease are returning with extensive, painful lesions suggesting that earlier treatment might be indicated (despite the lack of RTC for efficacy in humans)

Prognosis depends on:

• Previous vaccination status
• Immunocompromise status
• Concurrent illnesses or comorbidities

https://www.cdc.gov/poxvirus/monkeypox/clinicians/treatment.html
Symptom management is KEY
• Analgesics, antipruritics
• Sitz baths with Epsom salt
• Clinics in London using cinchocaine/hydrocortisone suppositories for proctitis with good effect
  • Alternative in SF = lidocaine/hydrocortisone cream

Empiric treatment for potential associated STIs
• Ceftriaxone, doxycycline, acyclovir/valacyclovir, penicillin

Anticipatory guidance
• Disease course and timing; antivirals available if symptoms worsen; warning signs for hospital evaluation
Monkeypox Antiviral Treatment Indications

Severe disease
• Hemorrhagic disease
• Confluent lesions
• Secondary bacterial infections
• Requiring Hospitalization (e.g., sepsis, encephalitis, pneumonitis, urinary retention, epiglottitis)

"Aberrant" infections
• Implantation in eyes, mouth, or other hazardous area
• Lesions due to location or pain impeding function (i.e., urethral meatus, phimosis, extensive perianal/proctitis, oropharyngeal ulcerations, tonsillitis, esophagitis)

https://www.cdc.gov/poxvirus/monkeypox/clinicians/treatment.html
High risk for severe disease:

• Immunocompromised
• Children, particularly <8 years
• Pregnant or breastfeeding women
• History of atopic dermatitis or active exfoliative skin conditions
• One or more complication:
  • Secondary bacterial infection
  • GI involvement with dehydration
  • Bronchopneumonia

https://www.cdc.gov/poxvirus/monkeypox/clinicians/treatment.html
Monkeypox Treatment Options

- Tecovirimat (T-POXX)
- Vaccinia Immune Globulin Intravenous (VIGIV)
- Others:
  - Cidofovir
  - Brincidofovir

https://www.cdc.gov/poxvirus/monkeypox/clinicians/treatment.html
Tecovirimat (TPOXX)

Also known as TPOXX or ST-246, antiviral medication

Indications:
• FDA approved for smallpox
• CDC-held Emergency Access IND protocol: Allows for use for Monkeypox

Formulations:
• Oral capsule and IV formulations

Safety and Efficacy: limited but encouraging data
• Safety trial in humans: very few, minor side effects
• Efficacy trial in animals: decreased mortality, lesion number
• Case reports in humans demonstrating benefit against monkeypox

https://www.accessdata.fda.gov/drugsatfda_docs/label/2018/208627s000lbl
How to become a TPOXX prescriber

• Email monkeypox@sfdph.org
• Complete CDC forms: IND 1572, ICF, patient intake form, during & post treatment forms, adverse event form
• Order medications through Medical Health Operating Area Coordinator (MHOAC)
• Patient visit during and post treatment (telehealth acceptable)
Preventing the spread: vaccination, isolation, and infection control
What happens when someone gets exposed?

• It may take 2-3 weeks for people to show symptoms.
• People are not infectious until they show symptoms.
• If they are vaccinated in the first 4 days after known exposure, it's possible to prevent the infection.
• No quarantine is necessary unless someone shows symptoms.
• Clinicians should call the Communicable Disease line to determine whether vaccine PEP is indicated and for info on where to send the patient
  • CD line: (415) 554-2830
Monkeypox vaccination with Jynneos

- Jynneos is FDA approved for ages ≥18 for prevention of monkeypox or smallpox. 2-dose series is administered a minimum of 4 weeks apart.
- Robust immunity typically develops from the 1st dose. Duration of immunity after just 1 dose is under study.
- **Use Post-Exposure**: initiate within 4 days after an exposure to prevent disease; within 14 days after an exposure may reduce severity of disease. No effect once symptomatic.
- **Use Pre-Exposure**: peak immunity is 2 weeks after the 2nd dose; the 2nd dose confers long term immunity.
Monkeypox vaccination with Jynneos

• Use in children is still investigational: requires single-subject FDA approval and informed consent process.
  • SFDPH has posted information at www.sfcdcp.org/monkeypoxhcp for how clinicians can get approval

• Jynneos is NOT for people who need monkeypox treatment or who have already developed monkeypox disease. Someone with monkeypox-compatible symptoms should be evaluated for disease.
  • There is no danger if vaccine is given to someone who has symptoms compatible with monkeypox.
Vaccine Eligibility

- Many San Franciscans need the protection offered by the monkeypox vaccine and should receive it.
- **Right now, priority population is gay, bisexual, trans people and other men who have sex with men who have had multiple sex partners in the past 14 days.**
- **Sex workers of any sexual orientation/gender are also a priority.**
- By prioritizing these populations, we are providing an equitable pathway for those communities most highly impacted by the virus.
- This may create more demand, but it outweighs the equitable access needed for those communities experiencing higher infection rates.
- Due to the limits of vaccine supply, although someone may be eligible for a vaccine, it does not mean a vaccine is readily available.
What about 2\textsuperscript{nd} doses?

• SFDPH is prioritizing 1st doses and deferring 2nd doses for nearly all vaccinees until supply improves.
• Meanwhile, vaccinees with moderate-severe immune deficiency, who may not have a full immunologic response to the 1st dose, may be offered a 2nd dose if supply is available.
• Jynneos effectiveness is less than 100% even with 2 doses. Duration of immunity is unknown.
• Therefore, even after vaccination, everyone is recommended to take precautions to minimize further exposures.
SF Vaccine Strategy

• Establish **network of sites** with DPH and across systems of care
  • Geographic diversity
  • Variety of health systems
  • Drop-in and appointment options
  • Venue-based and pop-up events
  • Real-time accurate messaging to community about where and when vaccines are available

• Distribute vaccine we are allocated **QUICKLY** in order to:
  • Build immunity in community as rapidly as possible
  • Demonstrate to state and CDC that we have the infrastructure to vaccinate and the demand

• Prioritize **health equity**
  • Partner with CBOs to do active outreach to those disproportionately impacted by MPV, uninsured or experiencing historical inequities in access to services

• Build on lessons learned from community during other infectious disease challenges such as COVID and HIV
### SF Vaccines

<table>
<thead>
<tr>
<th>Jynneos vaccine</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total doses requested</td>
<td>35,000</td>
</tr>
<tr>
<td>Total doses received as of 7/25</td>
<td>7,814</td>
</tr>
<tr>
<td>Total distributed to SF clinics to date</td>
<td>7,597</td>
</tr>
<tr>
<td><strong>Total number of people vaccinated</strong></td>
<td>6567+ (as of 7/25)</td>
</tr>
</tbody>
</table>

- Expect to receive 2800-3800 doses this week as part of Phase 2b allocation
- Timing and size of subsequent allocations are unclear
How do clinics request to offer Jynneos?

• NEW providers complete a 1-time vaccine interest survey
  • https://forms.office.com/Pages/ResponsePage.aspx?id=z8LVlj7OPUSaf9_MAjH3P1rfnRidRSBDm_20KLmjd3NUMk9WV1YxRIvaV1ZMVVhWSUJHWVpDRTQ4RyQlQCN0PWcu

• If interested in distributing Jynneos at your clinic, please fill out the survey as best you can. We know you may not know your full capacity or size of certain populations, estimates are fine

• Sections:
  • Location & Contact Information
  • Vaccine Request- your answers do not guarantee you will receive vaccine
  • Patient Information- Guesstimates are OK
  • Capacity- Your best guess to help us plan allocations while the vaccine is still in short supply.
What should we be telling patients about prevention?

• Consider covering exposed skin in dense, indoor crowds
• Avoid touching bedding or clothing from someone who has a rash
• Using safer sexual practices to avoid opportunities for monkeypox to spread
• Talk to close physical contacts about their general health like recent rashes or sores
• Stay aware if traveling to countries where there are outbreaks
• Stay up to date – public health guidance may change as we learn more about the disease
• Household cleaners/detergents and regular cleaning will kill monkeypox virus on surfaces (but should not be used on skin)

You can keep yourself safe!
What to tell your patients if they have symptoms

- Stay home if you are feeling sick!
- Contact a health care provider as soon as possible
- Cover the area of the rash with clean, dry, loose-fitting clothing
- Wear a well-fitted mask (remember spread can happen through close contact with respiratory droplets as well)
- Avoid skin-to-skin, or close contact with others
- Assist public health officials to identify others who may have been exposed
- Refrain from sex until you are medically evaluated
- Screen regularly for sexually transmitted infections. Syphilis and herpes are much more common than monkeypox – they appear similar and should be treated
Isolation and Infection Control

• Standard precautions (surgical mask, gloves) for examining patients
• Infection control for sampling lesions includes:
  • Gown
  • Gloves
  • Eye Protection
  • N95
• Use virucidal wipes to clean surfaces in contact with patients' skin, clothing
• Period of Infectivity:
  • Patients are infectious from start of symptoms
  • Isolation: Until rash has fully resolved (scabs have fallen off, a fresh layer of intact skin has formed)

https://www.cdc.gov/poxvirus/monkeypox/clinicians/infection-control-healthcare.html
How do we avoid stigma?

- Stigma about disease is real – many examples of disease attributed to race, sexual orientation, or cultural identities
- Rights-based, evidence-based approach that increases awareness while actively countering stigma
- Open, affirmative and respectful conversation about health and issues to support people at higher risk of infection
Key Messages

1. Keep MPX on your differential when assessing someone with symptoms of an STI or rash. Collect specimens and counsel the patient to isolate and cover lesions while results are pending.

2. There is an antiviral medication available with limited efficacy data. Consider becoming a TPOXX prescriber. Supportive care is key.

3. Vaccines are a crucial part of our prevention efforts, but supply is extremely limited at this time. Equity and speed are our goals.
Thank you & Questions

Short URL:  
[www.sfcdcp.org/monkeypoxhcp](http://www.sfcdcp.org/monkeypoxhcp)

- Reporting
- Testing and specimen submission
- Vaccination Information
- Therapeutics
- MPX-related Advisories
Selected Sources and resources


