# Decision Making in Monkeypox (mpox)

## ABOUT MPOX

**Mpox virus is a DNA virus in the Orthopoxvirus genus, which also includes the variola virus (smallpox) and vaccinia virus (used in smallpox vaccines). There are two genomic clades: I and II a and b (mostly clade IIb in USA, Europe, Australia) which is usually less severe.**

**Transmission**
- Close contact with infectious person or animal or with contaminated materials (fomites)
- Through skin and mucous membranes (oropharyngeal, anorectal, conjunctival, nose, mouth, or genitalia)
- In the 2022 outbreak, transmitted predominantly through sexual contact between gay and bisexual men having sex with men (GBMSM)

**Incubation period** typically 7 to 14 days (range of 5 to 21 days).

**Clinical presentation and outcomes** Mpox is self-limiting with symptoms lasting 2 to 4 weeks.

**Prodrome** lasting 1 to 5 days with lymphadenopathy, fever, headache, myalgia, arthralgia, back pain and sore throat.

**Rash** develop 1 to 5 days after the onset of fever. Progress through macules, papules, vesicles, pustules to crusted scabs 14 to 21 days after rash onset. Scabs then fall off.

**Clinical presentations** Other than the typical rash, cases can be mild, sometimes with very few lesions or a single lesion. Lesions may be only genital or perianal or oral. Skin lesions may be absent instead presenting with proctitis, rectal pain, rectal bleeding or urethritis. In the 2022 outbreak many people presented with rash prior to prodromal symptoms or without prodromal symptoms.

**Severe complications** of mpox infection include secondary bacterial skin infection (cellulitis) bronchopneumonia, sepsis, encephalitis, corneal infection (with subsequent scarring and loss of vision), severe pain (e.g. perianal, penile) and rectal bleeding.

**Infectious period** begins with the onset of symptoms. Cases remain infectious until the rash has resolved, and all lesions have formed scabs and fallen off leaving fresh skin underneath.

**Mortality** globally ranges from 0% to 11%, clade IIb <1%.

## STEP 1: COULD IT BE MPOX?

**Consider travel and exposure history**
Anyone who is in very close contact with someone with mpox, such as skin-to-skin contact is at risk.

The current outbreak has occurred primarily in gay, bisexual and other men who have sex with men.

**Consider wide range of clinical presentations** (see About mpox).

## STEP 2: TESTING

**Contact testing laboratory** to arrange receipt of specimens.

**Appropriate personal protective equipment (PPE)** should be worn while collecting samples from patients with suspected mpox infection.

**Take mpox PCR swabs** from at least 2 lesions using individual dry swabs.

Collect a rectal swab if proctitis only and no skin lesions.

**Consider STI screen** including syphilis and HIV.

**Consider other causes of skin lesions** including syphilis, varicella (chickenpox), herpes zoster (shingles), herpes simplex, measles, molluscum contagiosum and bacterial infection.

## STEP 3: MANAGEMENT

All patients need counselling regarding natural history, transmission and need for close follow-up.

Most cases will not require specific treatment other than supportive management such as antipyretics, analgesia and adequate hydration. Some require treatment of common complications including antibiotics for secondary cellulitis.

Occasionally people require hospital admission to manage severe disease (haemorrhagic disease, confluent lesions, sepsis, encephalitis) or in those with immunocompromise or lesions in critical sites such as the eye.

**Contact Public Health Unit (PHU)**

**Advise need for isolation:**
Avoid high-risk settings (health care, schools), physical or sexual contact with others, contact with people who are at higher risk of severe disease (immunocompromised, pregnant women, children), close contact with animals, particularly dogs and rodents.

Cases should stay at home (except for undertaking essential activities), sleep in a separate room (if available) and limit contact with household members, wear a mask when in the same room as others and cover skin lesions, not share house-hold items. Discuss cases with PHU to obtain appropriate isolation advice.

**Case clearance:** Cases can resume normal activity when all lesions have crusted, scabs fallen off and a fresh layer of skin has formed underneath.

**For 12 weeks following clearance, cases:**
- May wish to use a condom during sexual activity to reduce the risk of transmission to sexual partners who have not been vaccinated or previously infected with mpox.
- Should not donate blood, cells, tissue, breast milk, semen or organs.

**Contact management:** Discuss with PHU. May include isolation, vaccination.

**Guidance for cases with non-visible skin lesions** (e.g. proctitis) - it is recommended to follow the above until complete resolution of symptoms.

# Vaccination mpox: using JYNNEOS® 3rd Generation

## AVAILABLE VACCINATIONS

Smallpox vaccines contain the vaccinia virus, a poxvirus related to smallpox and mpox. Vaccines using the vaccinia virus for the prevention of smallpox are effective against mpox.

**The vaccine used in Australia for mpox prevention is the JYNNEOS® vaccine (MVA-BN: modified vaccinia Ankara vaccine-Bavarian Nordic).**

**JYNNEOS®** is a highly-attenuated vaccine that is replication-deficient.

**The primary course of JYNNEOS® is two doses, with a minimum dose interval of 28 days.**

## TARGET GROUPS (DEPENDS ON STATE)

1. Post-exposure Preventive Vaccination (PEPV): high risk mpox contact in the past 14 days.
2. Gay, bisexual and other men who have sex with men (GBMSM) and their partners.

   Note that some jurisdictions require other risk factors such as living with HIV, taking HIV pre-exposure prophylaxis (PrEP) or recently diagnosed with a sexually transmitted infection.
3. Sex workers, particularly those whose clients are in high-risk categories.
4. Anyone in the above high-risk categories who is planning travel to a country experiencing a significant outbreak, with vaccination recommended 4-6 weeks prior to departure.
5. Anyone at greater risk of a poor clinical outcome from mpox infection, such as individuals with immunocompromise.
6. Vaccination may be considered for healthcare workers at higher risk of exposure to patients with mpox.


**REFERENCES**

- Monkeypox Virus Infection – CDNA National Guidelines for Public Health units: www.health.gov.au/resources/publications/monkeypox-virus-infection-cdna-national-guidelines-for-public-health-units
- CDC: www.cdc.gov/poxvirus/monkeypox/index.html
- ATAGI Clinical Guidance on Vaccination Against Monkeypox: www.health.gov.au/resources/publications/atagi-clinical-guidance-on-vaccination-against-monkeypox


## VACCINATION PROTOCOL

**Primary preventive vaccination (PPV)**
Standard administration of JYNNEOS® is by subcutaneous injection (SC).

**JYNNEOS®** can be administered by intradermal injection (ID) at a lower dose as an alternative route for PPV.

The intradermal route is not recommended for people with severe immunocompromise.

**Dosing:**
Subcutaneous route (SC): 2 doses of 0.5mL each
Intradermal route (ID): 2 doses of 0.1mL each
Note – can mix SC or ID doses in any order

**Post-exposure Preventive Vaccination (PEPV)** should be considered as soon as possible after confirmed mpox exposure.

Vaccination within 4 days will provide the highest likelihood of prevention of disease.

Vaccination between 4 to 14 days is anticipated to attenuate disease.

**Dosing:**
1st dose SC, 2nd doses SC or ID.
Intradermal route is not preferred as the first dose of PEPV.

**After smallpox vaccine:**
A single booster dose is recommended if the previous dose of a smallpox vaccine was given more than ten years prior.

**After laboratory-confirmed mpox:**
Not recommended to receive vaccination against mpox in the short to medium term.

## VACCINATION SAFETY

**Contraindications:** anaphylaxis to a previous dose or to a component of the vaccine. JYNNEOS® contains benzonase, gentamicin and ciprofloxacin.

**Safety in people with immunocompromise:** considered safe to use.

**Pregnant or breastfeeding:** has not been formally evaluated in pregnant or lactating women, but there are no theoretical safety concerns.

**Safety in children:** not formally studied in < 18 years.

**Safety in people with history of keloid scarring:** avoid intradermal route.

**Theoretical risk of myocarditis or pericarditis,** but no serious cases reported during clinical trials or post-marketing use.

**Risk of other serious adverse events:** no other notable serious adverse events based on available data.

**Co-administration:** considered safe to co-administer with other vaccines.

## ADVERSE EVENTS TO VACCINATION

**Injection site reactions:** pain 85%, redness 61%, swelling 51%, induration 45%, itch 43%.
**Systemic adverse events:** Muscle aches 43%, headache 35%, fatigue 30%, nausea 17%, chills 10%, fever 2%.

22 clinical studies which included over 7800 participants who received an MVA-BN vaccine after 1st dose.

## EFFICACY

No randomised controlled trials have been conducted in mpox. Effectiveness of **JYNNEOS®** for primary preventative vaccination against mpox is extrapolated from smallpox data and suggests at least at 80% effectiveness. There is limited data on PEPV effectiveness – see references.