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Mpox: Understanding the Outbreak

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Mpox, formerly Monkeypox, is a viral illness caused by the Monkeypox virus. This virus is a member of the Poxviridae family, which makes it closely related to the ancient extinct virus, Smallpox (variola) [1]. Mpox It was first discovered in 1958, and the first human infection was recorded in 1970 [2]. After that it caused several outbreaks, namely in 2003, 2021 and 2022 [3]. There are 2 types of this virus, Clade I, the more severe form, and Clade II, the milder form [2]. The 2022-2023 outbreak was caused by Clade II, but the 2024 outbreak is caused by Clade I, which has a case-fatality rate of around 10% [2, 4]. On Wednesday, August 14, 2024, the World Health Organization (WHO) declared the spread of Clade1 to be a public health emergency of international concern (PHEIC) [5]. This review will focus on what the clinician needs to know about mpox, and how to identify, manage and prevent it.

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Away from all stereotypes, anyone can catch mpox. It can spread directly from animals through hunting, skinning or cooking, and it can spread from human to human, by close contact (talking), kissing , by sexual contact or vertical transmission [6]. The virus is able to infect a host by penetrating injured skin or mucosal membranes. That being said, it is possible for mpox to spread by fomites and linens [6]. When the outbreak started in 2022, it was mainly among the men who have sex with men (MSM) population, but it was later revealed that the primary mode of transmission was through skin contact that is prolonged during sexual encounters [7]. That being said, risk of transmission is not the same among all modes, as will be discussed later in this review.

Signs and symptoms of mpox can start as early as 1 day or as long as 3 weeks after exposure [6]. This period is not usually contagious, unless prodromal symptoms are present [8]. The infection lasts anywhere between 2 and 4 weeks [6]. The most common symptom is rash, but this can vary from fever, sore throat, headache, myalgias, fatigue to lymphadenopathy [6]. Some rarer symptoms can be proctitis, tonsillitis and conjunctivitis that can progress [9, 10]. The rash is a flat papule that becomes vesicular, which is itchy and sometimes painful [6]. The rash usually umbilicates and develops into a pustule then followed by a dark scab [8]. As they dry-up, they crust then fall-off [6]. Mpox rash can occur anywhere on the body, including palms, soles, eyes, genital and anal areas [6]. When it occurs on the anogenital areas, patients might complain of dysuria or painful defecation [6]. The mpox rash remains infective until the whole scab falls off and new intact skin is formed [6].

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Mpox can cause multiple complications, such as blindness, dysphagia causing malnutrition and dehydration, encephalitis, myocarditis, proctitis, urethritis, bacterial superinfection causing sepsis, blindness or death [6]. Immunosuppression, including uncontrolled HIV are risk factors for a more severe mpox infection [6]. Therefore, the differential diagnosis of Mpox can be wide and tricky, including but not limited to chickenpox, smallpox, other rash-causing infectious and non-infectious complications and autoimmune diseases. The main differentiation before testing is through exposure history and the shape of the rash [11].

Since a lot of infections and non-infectious conditions cause rashes that is similar to the mpox rash, diagnosis can be challenging [6]. The best diagnostic method is polymerase chain reaction (PCR) of samples collected by swabbing fluid directly from the lesion, extracting dried-up skin or crust by vigorous swabbing or scraping or oropharyngeal swabs. Blood PCR or serology is not recommended and has a low yield [6].

There is only 1 vaccine that is Food and Drug Administration (FDA)-approved for mpox (and smallpox) [12]. There are a few antivirals available for mpox treatment, but these are last resort and not FDA-approved [12]. Currently, the treatment of mpox is supportive management and isolation to prevent transmission [6].

Mpox screening requires stratifying cases to suspected, probable and confirmed. A suspected case in when there is a rash with clinical suspicion after being exposed. A probable case is defined by having a PCR-confirmed presence of Orthopoxvirus nucleic acid on a specimen, or after immunohistochemistry [13]. It can also be defined by the presence of anti-Orthopoxvirus IgM within 4-56 days of the rash, but this method of screening is not advised. A confirmed case is present when there is mpox-specific PCR positivity [13]. If the rash does not develop within 5 days after onset of illness, or if a high quality specimen yields negative mpox PCR, this can exclude mpox [13].

Exposure is defined by the CDC as minimal, intermediate and high. Low exposure is contact with a person infected with mpox with completely covered lesions without contact with any lesions, crusts or fluids (even if dried up) directly [14]. Intermediate exposure is contact of exposed intact skin with lesions, crusts or fluids from a person with mpox or exposure to dried lesion fluids. Entering the room of a person with mpox or examining their mouth without personal protective equipment is also intermediate risk [14]. High risk is defined as contact of broken skin/membranes with lesions or fluids from an individual with mpox. It can also be defined as exchange of body fluids, using soiled linen or sharps injury with material used by an infected individual [14].

For minimal risk, people would be monitored, while for high-risk they would be monitored and receive PEP. For intermediate risk, PEP decision is case by case.

Exposed people should be monitored for 21 days but not isolated. If any rash develops, in-patients should be put on airborne and contact isolation [14]. Other individuals should be home isolated without access to pets. Isolation is stopped when mpox is ruled out by testing [14]. If any symptom other than rash develops, patients should be isolated for 5 days until any new symptom or rash develops, even if this extends beyond 21 days. If 5 days pass without any new rash or symptoms, isolation can be removed [14].

Two vaccines are available for mpox: JYNNEOS, which is a 2-dose vaccine, and ACAM2000, which is not commercially available.15 Vaccination provides long-lasting immunity for more than 5 years and no booster is needed. Previously infected people do not need to be re-vaccinated [15]. The current guidelines for vaccination includes people with occupational exposure, men who have sex with men (MSM), non-binary and transgender people who have multiple sexual partners, commercial sex workers, sex in large public events where an active outbreak is happening, sex partners of infected individuals or any person who asks for it [15]. Of course, having taken the vaccine for Mpox or smallpox is a protective factor against infection.

PEP should be given as soon as possible, within 14 days after exposure, in the form of the JYNNEOS vaccine [15]. JYENNOS is a live attenuated virus that does not replicate, therefore it is safe in immunocompromised individuals [15]. Currently giving it in pregnancy, breastfeeding and in people under 18 years of age is not a guideline [15].

The only antiviral available to treat mpox is tecovirimat, but it is only authorized under "exceptional circumstances" in the United States and Europe, as studies have shown its effectiveness in decreasing mortality but safety has not been established [16]. Tecovirimat should be given for 14 days. However, its efficacy and safety is not yet established and a lot of trials are on-going to determine this, making it less available for use [17]. Currently, taskforce is centered around acceptance and public health measures such as spreading prevention and awareness to stop the outbreak [18].

There are other options, such as Brincidofovir, which is a smallpox treatment, cidofovir and intravenous immunoglobulin (IVIG), but all of these are not part of the guidelines and are still under study for Mpox, though they offer promise of future treatments [19].

The algorithm **(Figure 1)** provided below provides a walkthrough of how to manage a person exposed to mpox.

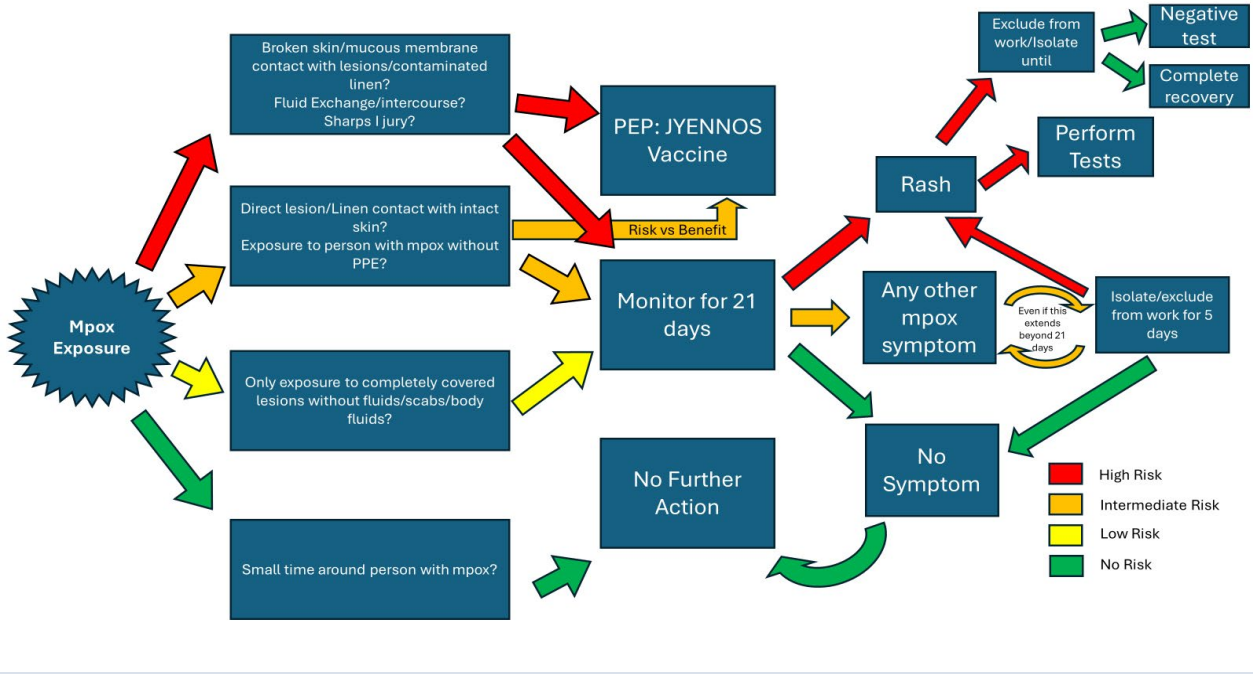

FIGURE 1 - Algorithm to how to manage a person exposed to mpox.

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Conflicts Of Interests

The Authors declare that there is no conflict of interest.

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Registration

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Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Ethical approval

Ethical approval for this study was not required.

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