

WHO guidelines for clinical management of mpox



**World Health
Organization**

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Contents

Acknowledgments	v
Abbreviations	viii
Executive summary.....	ix
1 Background.....	1
1.1 Virus clade characteristics.....	1
1.2 Overview	3
1.3 Signs and symptoms.....	3
1.4 Differential diagnosis.....	4
1.5 Mid- and-long-term effects	5
1.6 Transmission and viral shedding	5
2 Methods used to develop this guideline	9
2.2 Guideline Development Group	11
2.3 GRADE-based recommendations.....	11
2.4 Implementation guidance	12
2.5 Guiding principles: general health care principles and "good practice statements"	13
2.6 Importing and adapting existing WHO guidance	13
2.7 GDG topic-specific working groups	13
3 Infection prevention and control.....	18
3.1 IPC in home-based care.....	18
3.2 IPC in health facilities	25
3.3 Management of the deceased patient.....	34
4 Organization of the care pathway.....	35
4.1 Screening.....	35
4.2 Triage	35
4.3 Clinical assessment	36
4.4 Testing for mpox	44
5 Interpersonal and psychosocial support	45
5.1 Mental health, and psychosocial support	45
5.2 Communication	47
5.3 Sexual activity	50
6 Skin.....	52

6.1	Skin anatomy.....	52
6.2	Terminology in this guideline	52
6.3	Skin care (non-complex lesions).....	53
6.4	Complex lesions, abscess and bacterial skin infection.....	63
7	Complications and concomitant conditions	74
7.1	Rate of complications	74
7.2	Mpox-associated eye disease	75
7.3	HIV.....	80
8	Symptoms and general care	92
8.1	Pain	92
8.2	Nutrition.....	95
8.3	Hydration	96
8.4	Other symptoms.....	97
9	Mpox antivirals.....	98
10	Special populations.....	99
10.1	Pregnancy	99
10.2	Breastfeeding	105
11	Knowledge gaps and research priorities.....	113
11.1	Transmission.....	113
11.2	Clinical management.....	113
11.3	Infection prevention and control	113
11.4	Methods questions	114
11.5	Standardized data collection	114
12	Additional tools.....	115
	References	116

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Abbreviations

ABCDE	airway, breathing, circulation, disability, exposure (a standardised, ordered clinical approach to assessment and treatment in emergencies)	IO	intraosseous
ACH	air changes per hour	IPC	infection prevention and control
AGP	aerosol-generating procedure	IRIS	Immune reconstitution inflammatory system
ALT	alanine transaminase	IRPs	infectious respiratory particles
AMR	antimicrobial resistance	IV	intravenous
ARDS	acute respiratory distress syndrome	LGV	lymphogranuloma venereum
ART	antiretroviral therapy	MDR	multidrug-resistant
AST	aspartate aminotransferase	mpox	mpox is the preferred term as a synonym for monkeypox
AVPU	alert, voice, pain, unresponsive (scale)	MPXV	monkeypox virus
BEC	Basic Emergency Care	MRSA	methicillin-resistant <i>Staphylococcus aureus</i>
BMI	body mass index	MSSA	methicillin-sensitive <i>Staphylococcus aureus</i>
CBT	cognitive behavioural therapy	MUAC	mid-upper arm circumference (in children)
CFR	case fatality rate	NIOSH	National Institute for Occupational Safety and Health (United States of America)
CSF	cerebrospinal fluid	OR	odds ratio
DGI	disseminated gonococcal infection	PAHO	Pan American Health Organization
DOI	declaration of interest	PCR	polymerase chain reaction
FFR	filtering facepiece respirator	PEP	post-exposure prophylaxis
GDG	guideline development group	PHEIC	Public Health Emergency of International Concern
GRADE	Grading of Recommendations Assessment, Development and Evaluation	PICO	population, intervention, comparison, outcome
HAI	health care-associated infection	PPE	personal protective equipment
HR	hazard ratio	PTSD	post-traumatic stress disorder
HSV	herpes simplex virus	RR	relative risk
IDP	internally displaced person	RT-PCR	real-time polymerase chain reaction
IFRC	International Federation of Red Cross and Red Crescent Societies	STI	sexually transmitted infections
IITT	Interagency Integrated Triage Tool (WHO/IFRC)	VZV	varicella zoster virus
IMCI	Integrated Management of Childhood Illness	WBC	white blood count
		WHO	World Health Organization

Executive summary

Clinical question: *Which clinical and infection prevention and control interventions improve the care of patients with mpox?*

Scope: The guideline considers interventions across the mpox patient pathway, including: screening; triage; routine care for high- frequency symptoms; assessment and treatment for severe disease and complications; discharge from health facilities. Overarching questions of infection prevention and control (IPC) are addressed where they specifically impact the safety of patients with mpox and their carers.

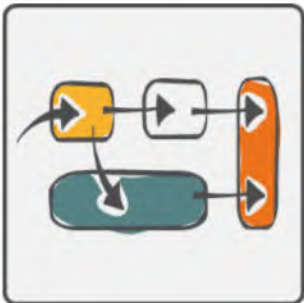
Target audience: This document is for public health professionals, health emergency responders, clinicians, health facility managers, health and care workers and IPC practitioners including but not limited to those working in primary care clinics, sexual health clinics, emergency departments, dental practices, infectious diseases clinics, genitourinary clinics, maternity services, paediatrics, obstetrics and gynaecology and acute care facilities that provide care for patients with suspected or confirmed mpox, and those caring for them at home.

Context: Since the first publication of the WHO Clinical management and infection prevention and control for monkeypox: Interim rapid response guideline in 2022 [1], the causative virus, known as the monkeypox virus (MPXV), and outbreaks associated with it have continued to evolve. Prior to 2022, cases were primarily reported in Central and West Africa. In 2022, a global outbreak of clade IIb virus was declared and continues to affect numerous countries. Since 2023, there have been outbreaks associated with clades Ia and Ib, primarily affecting the Democratic Republic of the Congo and neighbouring countries. Since August 2024, there have been increasing numbers of MPXV cases across Africa linked both to clades I and II, and detection of clade Ib beyond the African continent. The epidemic risk and widespread transmission of MPXV led to a second declaration by the WHO Director-General of a Public Health Emergency of International Concern (PHEIC) [2] initiated on 14 August 2024 and lifted on 5 September 2025.

What triggered this update: WHO made initial recommendations as interim guidance for mpox in 2022 [1]. Since then, the current global outbreak demonstrates sustained human-to-human transmission occurring during close contact including sexual contact. This update represents a systematic assessment of key interventions which underpin high-quality supportive care, and makes recommendations which aim to improve morbidity and mortality even in the absence of effective mpox antivirals.

How the guidance has been updated and expanded: This version incorporates new evidence to update recommendations for clinical management and IPC for mpox. It takes an individual patient perspective in making recommendations, and considers resource implications, acceptability, feasibility, equity and human rights. In this version nearly all recommendations from the 2022 interim guidance have been re-evaluated. New recommendations have been issued according to GRADE methodology. The document complements these with additional guidance based on guiding principles (incorporating “good practice statements” and “general medical principles”), and relevant guidance incorporated from other relevant WHO documents.

Table ES1: Available recommendations within the document

		First contact with health system (pharmacy, clinic)	Hospital contact			Home care
			Baseline / immediate	Early	Late	
<i>Infection prevention and control</i>		<u>IPC measures while lesions are unhealed</u>	Health and care workers: use contact and droplet precautions IPC measures for deceased Action after occupational exposure	<u>Home isolation not required provided well applied IPC</u> IPC measures for deceased		<u>IPC measures while lesions are unhealed</u>
<i>Organization of the care pathway</i> 	Screening and triage	<u>Use case definition for screening</u>	<u>Use triage system e.g. ICRC</u> [≥12 years] [<12 years] Use ABCDE approach + record observations			
	Monitoring		Severity based frequency of monitoring		<u>Specialty referral if initial treatment unsuccessful or deteriorating condition</u>	
	Clinical and laboratory evaluation		<u>Symptoms, SAMPLE history and secondary approach</u>			
	Testing	Test for mpox virus by nucleic acid amplification testing (NAAT) Test for HIV				
<i>Interpersonal and psychosocial support</i> 	Communication		<u>Counsel on isolation</u>	<u>Counsel and respond</u>		<u>Counsel on need for hospital care</u>
	Psychosocial support (especially around isolation)	Provide psychosocial support	Assess mental health and psychosocial support Support good sleep hygiene	Provide psychosocial support Encourage safe visits Depressive symptoms: consult mental health provider and use available guidelines		Provide psychosocial support Advise on sexual activity Provide IPC for carers
	Stigma		(in preparation)			

		First contact with health system (pharmacy, clinic)	Hospital contact		Home care
			Baseline / immediate	Early	Late
<i>Mpox antiviral</i>	Mpox antiviral treatment	Under revision			
<i>Symptoms and general care</i> 	Pain	<u>Use analgesia ladder</u>	<u>Use analgesia ladder</u> with regular re-evaluation		<u>Use analgesia ladder</u>
	Fever		<u>Assess infection, sepsis, malaria</u>		
	Hydration	Assess	<u>Use available guidelines for assessment</u>	<u>Use available guidelines for treatment</u> <u>Use nasogastric tube if necessary</u>	
	Nutrition	Assess	<u>Assess with MUAC and treat [child]</u> <u>Use nasogastric tube if necessary</u>	<u>Provide nutrition support</u> <u>Treat SAM [child <5 years]</u>	
	Other symptoms		<u>Use antihistamine or antiemetic as required</u> <u>Give sleep hygiene advice</u>		
<i>Skin</i> 	Skin care (in the absence of clinical secondary bacterial infection)	Intact skin cleaning: <u>use soap and (clean water or saline)</u>	Intact skin cleaning: <u>use soap and (clean water or saline)</u> Broken skin cleaning: <u>use soap and (clean water or saline); consider antiseptics based on site and lesion type</u> Covering lesions not routinely recommended (note: IPC considerations) Routine topical or systemic antibiotics not recommended		
	Skin lesions (severe/ extensive)	<u>Specialty referral</u>	<u>Specialty referral</u>		
	Uncomplicated skin infection (including cellulitis)	Mild: <u>use oral amoxicillin and clavulanic acid, cefalexin or cloxacillin</u>	Mild: <u>use oral amoxicillin and clavulanic acid, cefalexin or cloxacillin</u> Severe: <u>use intravenous route</u>		
	Complicated skin infection, including deep tissue infection	<u>Specialty referral</u>	After surgical drainage of skin abscess: <u>use systemic antibiotics</u> Pyomyositis: <u>use intravenous amoxicillin and clavulanic acid, or cefalexin, or cloxacillin</u> Necrotizing soft tissue infection: <u>immediate surgical evaluation; use (piperacillin-tazobactam plus clindamycin) or carbapenem with clindamycin</u>		

		First contact with health system (pharmacy, clinic)	Hospital contact			Home care
			Baseline / immediate	Early	Late	
<i>Other complications and comorbidities</i> 	Mpox-associated eye disease	<u>Specialty referral</u>	Specialty referral Topical corticosteroids not recommended Topical trifluridine recommended in clinical efficacy trial <u>Rapid initiation of ART</u> Use ABCDE approach + record observations Use existing guidelines for fluid management in sepsis Give broad spectrum antibiotics for suspected sepsis <u>Recognize and treat of hypoglycaemia [child] [adult]</u> <u>Treat seizures with benzodiazepine (magnesium in eclampsia); consider broader causes including meningitis, malaria</u> <u>Treat pneumonia according to severity (mild, oral antibiotics; severe, intravenous antibiotics); consider broader causes</u> <u>Specialty referral for myocarditis</u>			<u>Specialty referral</u>
	HIV					
	Complications					
<i>Malaria co-infection</i>			Test for malaria as possible	Suspected or confirmed malaria: use parenteral artesunate		
<i>Special populations</i> 	<i>Pregnancy</i>	Specialty referral Enhanced frequency of monitoring	<u>Specialty referral</u>		<u>Follow WHO guidelines for missed abortion or intrauterine fetal death</u> Use antibiotics for postpartum endometritis Instrumentation, augmentation and caesarean section performed only when medically justified on basis of maternal and fetal condition	
	<i>Breastfeeding</i>	<u>Continue breastfeeding with contact precautions</u>	Continue breastfeeding with contact precautions Resume breastfeeding when lesions fully resolved			
	<i>Neonates and infants</i>	<u>Specialty referral</u>	Specialty referral Screen for sepsis; treat with intravenous antibiotics	Ensure tetanus vaccination up-to-date		

BEC = Basic Emergency Care

[1] eye pain and/or redness [consistent with conjunctivitis and/or keratitis and/or other ocular pathology]

1 Background

Mpox is an infectious disease caused by monkeypox virus (MPXV), which comprises two clades; clade I (including subclades Ia and Ib) and clade II (including subclades IIa and IIb). Historically linked to zoonotic transmission in tropical rainforest regions of East, Central and West Africa, mpox has more recently spread predominantly through human-to-human transmission and emerged across all WHO regions.

WHO has declared mpox a Public Health Emergency of International Concern (PHEIC) twice. The first, in 2022, was triggered by the global spread of clade IIb MPXV through sexual networks, primarily among men who have sex with men with multiple partners. Transmission outside this group remained limited and declined by late 2023, leaving only low-level persistent sexual transmission.

The second PHEIC, in 2024, followed rising mpox cases in Africa and the emergence of clade Ib MPXV in several countries, many reporting mpox for the first time and detecting both sexual and non-sexual transmission. These outbreaks led to sustained community transmission, initially driven in many settings by heterosexual contact among people with multiple casual partners, including but not limited to sex workers, followed by household spread.

In most mpox affected areas since 2022, circulation persists, through both recognized and cryptic transmission, and the virus has established itself outside historically endemic countries, spreading mainly through human-to-human contact. Most up-to-date statistics on global mpox surveillance are available [here](#) [3]. Historical pooled mpox case fatality has ranged from 0–11% depending on the setting and clade of virus involved [4]. Several biases have affected these estimates over time, such as under-ascertainment of mild and moderate cases, reliance on suspected rather than confirmed cases, limited access to care and late presentation, age distribution of cases, co-morbidities and co-infections, reporting delays and incomplete follow-up, etc. When stratified over time, studies show a decreasing mortality of mpox, likely impacted by better ascertainment and improved clinical care [5]. When timely and good quality care is available, in most settings, the proportion of cases where death occurs (case fatality ratio) is below 1% [6].

1.1 Virus clade characteristics

MPXV belongs to the *Orthopoxvirus* genus of the *Poxviridae* family. It was first detected in Denmark in an animal in captivity 1958 [7] and human disease was first identified in 1970 in a 9-month-old boy in the Democratic Republic of the Congo [8]. Until 2022, most mpox cases were reported from Central and West Africa [9][10].

There are two distinct clades of MPXV; I (one) and II (two), each with two subclades [11]:

- clade I (Ia, Ib), previously known as the Central African (Congo basin) clade;
- clade II (IIa, IIb), previously known as the West African clade;
- subclade IIb is the group of variants circulating as part of the 2022 global outbreak.

Based on its geographical distribution, the populations most affected, and the clinical picture observed, each MPXV subclade presents some distinct epidemiological characteristics shaped.

These differences influence how outbreaks emerge, spread and persist, even though to date no inherent variation in transmissibility between subclades has been demonstrated.

1.1.1 Clade Ia

Clade Ia MPXV is found primarily as endemic disease in the parts of the Democratic Republic of the Congo, with spread into new provinces, including Kinshasa since 2023, and sporadic cases in neighbouring Central African Republic, Congo and Cameroon. The Democratic Republic of the Congo and the Central African Republic report a higher proportion of children among cases, while in Congo, most cases are among adults.

Previous genomic sequencing indicates that clade Ia MPXV emerges in human populations through zoonotic exposure, with limited human-to-human transmission. However, since 2024, one lineage has shown sustained sexual transmission in Kinshasa and has now been detected in other Democratic Republic of the Congo provinces as well as in travel-associated cases abroad. Sustained transmission of clade Ia has not yet been documented in the Central African Republic.

1.1.2 Clade Ib

Clade Ib MPXV, first detected in 2023 in South Kivu province of the Democratic Republic of the Congo, has spread to neighbouring countries, where it has established itself through community transmission, and is currently circulating in all WHO regions. Secondary transmission from imported cases have been limited, but once the strain enters interconnected sexual networks, it can rapidly spread, possibly through some pre-symptomatic or pauci-symptomatic virus shedding. No cases have been attributed to animal exposure, and genomic data indicate exclusive human-to-human transmission from the strain first identified in South Kivu [12][13].

In settings where transmission persists, it is likely driven by a combination of sexual, household and community contact. Transmission patterns appear to evolve, with more spread within households, leading to a shift in age and sex distribution with a rising proportion of cases among children. The majority of cases in most settings are adults, of both sexes, nevertheless a few areas show a higher number of children among reported cases.

1.1.3 Clade IIa MPXV

Clade IIa MPXV, has been historically associated with zoonotic exposure to infected animals, and is the strain with fewer detected human cases. Since 2024, cases have been reported in Côte d'Ivoire, Guinea and Liberia. Cases occur among adults and children, often without known epidemiological links. Outbreaks of clade IIa MPXV are a concerning new phenomenon as human-to-human transmission of this clade had not been reported before 2024 [14]. Furthermore, co-circulation of clade IIa and clade IIb MPXV has been reported for the first time, in both Côte d'Ivoire and Liberia. Limited epidemiological investigations have constrained our understanding of the modes of transmission in these outbreaks and clade IIa MPXV remains the least described MPXV strain in the scientific literature. Evidence suggests repeated zoonotic spillover with limited secondary transmission. Sexual transmission has not been documented, but close contact likely contributes.

1.1.4 Clade IIb MPXV

First detected in Nigeria during the 2017 outbreak, it is likely to have emerged few years prior [15]. It was the strain that caused the first global mpox outbreak in 2022 and has been circulating among humans since its emergence [16].

Most regions report circulation of clade IIb lineage B.1, while lineage A.1 continues to circulate in Nigeria and some countries in the WHO Eastern Mediterranean Region. The most affected population outside of Africa continues to be men who have sex with men, primarily exposed through sexual contact [17]. In instances where others have been affected, such as women and children, it has not led to sustained transmission, unlike that being observed for clade I MPXV in the African context.

1.2 Overview

The incubation period of mpox is usually 1 to 21 days following exposure to MPXV [18]. Acute mpox disease is typified by fever, malaise and a characteristic rash. Individuals are infectious from symptom onset until all lesions have fully healed; the majority of cases are self-limiting.

Although most people recover within 2 to 4 weeks, severe complications and sequelae have been reported to be more common among those unvaccinated for smallpox or mpox compared with those vaccinated (74% vs. 39.5%) [19], although overall the evidence is both inconsistent and uncertain (see Table 2). Mpox vaccination is approximately 85% effective in preventing mpox, but it is unclear how immunity wanes over time [20][21]. Individuals born after smallpox eradication in 1980 are unlikely to have received smallpox vaccine [9], but some countries have vaccinated at risk groups against mpox since 2022.

1.3 Signs and symptoms

Descriptions of outbreaks prior to 2022 described two phases, with an initial 1 to 5 day illness characterized by fever, headache, back pain, muscle aches, lack of energy and lymphadenopathy [22], followed by the appearance of a rash [21][23][24]. The rash typically presented in sequential stages – macules, papules, vesicles, pustules, umbilication before crusting over and desquamating over a period of 2 to 3 weeks. Lesions tended to spread centrifugally, from face and extending towards the palms and the soles [19][25].

However, subsequent descriptions from the 2022 clade IIb outbreak demonstrated that the majority (52–64%) of patients had skin lesions which preceded or were concurrent with systemic symptoms [26][27][28]. Lesions have not consistently presented in sequence, and multiple types of lesions co-exist. Many participants had primary lesions in the groin, perineum or peri-anal region (70–80%), and 43% in the oral or peri-oral area [26][27], consistent with primary inoculation sites from sexual contact [29]. Lesion numbers are highly variable from one to several thousand [9]. A distinct primary presentation was proctitis without peri-anal lesions [30].

Lymphadenopathy was described in 98.6% of a cohort of over 200 patients with clade Ia mpox in the Democratic Republic of the Congo [10][22]. Clade IIb outbreak data suggest lymphadenopathy is less common (around half) [31]. Oral ulcers are common and may affect a patient's ability to eat and drink leading to dehydration and malnutrition [23][32]. Pharyngeal, conjunctival and genital mucosal lesions also occur [23][33].

People living with HIV are disproportionately affected with mpox, and more commonly present with peri-anal lesions, higher rash burden, and atypical and more severe skin lesions [34][35]. Individuals with low CD4 count and high viral load have the greatest disease severity, hospitalization and mortality [36].

1.3.1 Severe disease, outcomes and complications

Patients with mpox may develop severe and life-threatening complications. To date, most reported deaths have occurred in babies, infants and immunocompromised individuals, such as those with poorly controlled HIV infection [19][37][38].

A study from the Democratic Republic of the Congo reported that in a cohort of 216 patients, there were three deaths in patients < 12 years of age. When compared with survivors, patients with fatal disease had higher amounts of mpox virus DNA in blood, a higher maximum skin lesion count, and raised liver enzymes (aspartate aminotransferase [AST] and alanine aminotransaminase [ALT]) at initial presentation [22]. Mortality rates decrease when there is access to timely and high-quality clinical care, and in individuals who have a better background health and nutritional status [39].

The largest case series of mpox in pregnancy recorded 17/89 (19%) experienced fetal loss during the acute illness, with worse outcomes in the first trimester, high lesion viral load, HIV coinfection, malarial coinfection and the presence of genital lesions [40].

Confluent skin lesions are at an increased risk of bacterial skin and soft tissue infections such as cellulitis, abscesses, necrotizing soft tissue infections requiring meticulous local wound care; subcutaneous accumulation of fluid in the crusting phase leading to intravascular depletion and shock; and exfoliation resulting in areas of skin that may require surgical debridement and grafting [23][24][32]. Other rarer complications include severe pneumonia and respiratory distress, infection of the cornea and other parts of the eye which may lead to vision loss, loss of appetite, vomiting and diarrhoea which may lead to severe dehydration, electrolyte abnormalities and shock, cervical lymphadenopathy and oropharynx involvement which may lead to retropharyngeal abscess or respiratory compromise, sepsis, septic shock, and encephalitis, proctitis, rectal perforation, myocarditis and death [37][19][38][22][23][24][33][41].

Prognosis, complications and risk factors are described in a 2024 systematic review [Annex Z](#), although limited data were available for children and pregnant women.

1.3.2 Laboratory findings

Small studies looking at laboratory abnormalities in patients with mpox indicate that leucocytosis, elevated liver transaminases, low or high blood urea nitrogen and hypoalbuminaemia were common features during illness, and that lymphocytosis and thrombocytopenia were seen in more than one-third of patients evaluated [10][22][32].

1.4 Differential diagnosis

The rash which develops in mpox may resemble the rashes caused by other infectious diseases or other conditions, including primary varicella zoster virus infectious (VZV, chickenpox), herpes simplex virus infection (HSV), primary or secondary syphilis, disseminated gonococcal infection (DGI), foot and mouth disease, chancroid, lymphogranuloma venereum (LGV), granuloma

inguinale, molluscum contagiosum, measles, scabies, rickettsia pox, chikungunya, Zika virus, dengue fever, vasculitis and other bacterial skin and soft tissue infections [42][43][44].

Disseminated cryptococcosis skin lesions may resemble mpox under some circumstances. WHO guidelines for diagnosing, preventing and managing cryptococcal disease among adults, adolescents and children living with HIV are available [45].

Often, the rash caused by VZV can be confused with mpox but may be distinguished as the VZV rash generally progresses more rapidly, is more centrally located than the centrifugal distribution of mpox, and patients usually do not classically have lesions on their palms and soles [10][19]. Additionally, patients with VZV typically do not have lymphadenopathy, which is a hallmark of mpox [19]. In the recent publication on cases from South Kivu, Democratic Republic of the Congo, lymphadenopathy differed significantly between age groups, while common in adults (82%) and children between 5–14 years old (69%), it was less frequent in children less than 5 years old (16%). In adults, inguinal lymphadenopathies were primarily affected, whereas in children, the submandibular nodes were more commonly involved [46].

Despite the clinical differences between these two diseases, a study from the Democratic Republic of the Congo reported polymerase chain reaction (PCR)-confirmed coinfection with mpox and VZV, with an incidence of 10–13% [47][48]. Patients with coinfection reported fatigue, chills, headache and myalgias. These individuals were less likely to report signs/symptoms of oral sores, axillary lymphadenopathy, cough or sore throat. Patients with coinfection had a higher lesion burden than seen with VZV alone but a lower rash burden than seen with mpox alone raising the suggestion that coinfection with these two viruses could modulate severity of the overall infection – an area for further investigation [47][48]. Other coinfections can occur, such as mpox and syphilis or gonorrhoea, mainly with sexual transmission.

1.5 Mid- and long-term effects

More information is needed about the clinical characterization of mid- and long-term effects of mpox. One study has reported > 90% of mpox survivors have no complications, regardless of smallpox vaccination status [23]. Of those who do develop long-term complications, most common sequelae are disfiguring scarring of the skin and blindness [19][23][49]. Pitted scars or pockmarks can develop [19][23]. Data also suggest that patients may be at risk for developing mental health complications [24].

1.6 Transmission and viral shedding

1.6.1 Detection of virus and viral shedding

Monkeypox virus (MPXV) DNA can be detected in a wide variety of clinical samples, including faeces, saliva, skin and mucosal lesions, as well as semen, urine and blood [50][51][52]. Replication-competent virus has been isolated from skin lesion swabs, oropharyngeal swabs, anal swabs, urethral swabs, conjunctival swabs and semen. Studies have shown that skin lesions, anorectal lesions and saliva contain the highest concentration of viral DNA [50][51][52].

The data describing mpox transmission and viral shedding show that transmission can occur from animal to human, human to animal, human to human, and from contaminated environments to

humans [53]. Previously, most of the available information was derived from the 2022 global mpox outbreak of clade IIb MPXV, which predominantly affected gay, bisexual and other men who have sex with men. In early 2024, a new MPXV strain, subclade Ib, was identified in the Democratic Republic of the Congo and neighbouring countries. Since the publication of the 2022 interim guideline two systematic reviews have been commissioned by WHO on transmission routes [54] with the latest review including literature published between September 2022 and September 2024. Both reviews found limited data on transmission of mpox by clade, specifically clade Ia and clade Ib MPXV, with no studies found reporting on clade IIa [54].

1.6.2 Animal-to-human transmission

MPXV can be transmitted from infected animals to humans via indirect or direct contact [21]. Transmission may occur from bites or scratches, or during activities such as hunting, skinning, trapping, cooking, playing with carcasses or eating animals, such as terrestrial rodents, non-human primates, antelopes and gazelles and tree squirrels [23]. Human-to-animal mpox transmission has been documented through close contact [55]. The extent of viral circulation in animal populations is not entirely known and further studies are underway [19][56]. Current evidence strongly suggests that the 2022 and 2024 multi-country outbreaks have not driven by animal-to-human transmission, rather through sustained human-to-human transmission [57].

1.6.3 Human-to-human transmission

Human-to-human transmission can occur through direct physical contact with infectious lesions of the skin or mucous membranes, contact with fluids or exudate from those lesions or infectious respiratory particles (IRPs) [10][58][57]. The 2024 review found only one report of a single case of self-reported “droplet exposure” out of the 32 317 cases that reported routes of transmission data (unpublished data). The single case was one of 12 breakthrough infections after post-exposure vaccination against mpox (the study defined droplet transmission as occurring during the presence of the exposed person without masks at less than 2 m for at least 3 hours with a PCR-confirmed mpox patient) [59]. There were no reported inhalation exposures. A study published in May 2022 on the clinical characterization of 216 patients diagnosed between 2007 and 2011 in the Democratic Republic of the Congo suggested that MPXV DNA in blood and the upper respiratory tract may be detected prior to onset of rash and that peak viral load may occur very early in the disease course [22]. While there have been studies that have shown the detection of MPXV DNA in air samples [60][61], and replicant-competent virus during bedding change in one United Kingdom hospital-based study [61], there has been no large-scale direct epidemiological evidence to date of airborne/inhalation transmission.

Children between the ages of 0–12 years old most often acquired infection after direct skin-to-skin contact with a caregiver or household member with mpox; whereas children between the ages of 13–17 years had similar exposure characteristics to those most commonly reported among adults (i.e. sexual contact) [62][63][64].

1.6.4 Sexual transmission

In the 2022 multi-country mpox outbreak, transmission was reported as primarily occurring through close physical, sexual contact (oral, vaginal, anal) [35]. The 2024 systematic review of non-comparative studies (222 studies describing transmission routes for 32 317 cases of mpox)

identified intimate physical contact (sexual contact and suspected sexual contact) as the primary mode of transmission (95.4%) followed by close (non-sexual) contact (2.9%). Therefore, contact transmission represented 98.3% of the 32 317 cases of mpox reviewed.

If infected during pregnancy, MPXV can cross the placenta leading to intrauterine exposure of the fetus and risk of congenital infection of the infant [65].

Multiple knowledge gaps remain surrounding mpox transmission, which are detailed and addressed in the WHO *Strategic framework for enhancing prevention and control of mpox: 2024–2027* [66].

1.6.5 Environment to human transmission

Environment-to-human transmission can occur through contact with MPXV contaminated objects, fabrics and surfaces (also described as fomite or indirect contact transmission) [67][68][69]. Pox viruses are generally more resistant to environmental conditions and show high environmental stability [70][71]. Studies conducted in health care facilities or in household settings, show that MPXV DNA can be found on several surfaces in the environment [43][72][73][74][75]. Some studies have shown the MPXV can also persist in the environment for several days after the patient with mpox has left the space; however, transmission through percutaneous injury with a contaminated object, fomite, transplacental and animal products were uncommon, accounting for approximately 1.8%. In 24 studies reviewed between 2022–2024 describing 3331 household exposures, 134 persons were infected (secondary infection rate of 4.02%) and the route of transmission was described as mainly close contact (non-sexual and sexual). Based on global surveillance data, less than 1% of reported cases have been attributed to fomite transmission [76][77]. While the risk of infection through contact with contaminated materials is low, it is not implausible [74][75]. Contaminated clothing or linens can disperse the MPXV if shaken [61][78]. The most recent systematic review conducted in 2024 (see details in Methods section – data are not yet published) did not find any health worker infections reported after exposure to contaminated bed linen of patients with mpox.

Mpox transmission through percutaneous injury with contaminated sharp objects has been documented in health and care workers during specimen collection [79] as well as in community settings, in particular tattoo parlours [80]. The review conducted in 2024 found 29 studies that examined exposures among health and care workers. Of the 1738 exposures reported, 14 became infected. Ten of these infections indicated percutaneous injuries as the route of transmission.

1.6.6 Infectious period

Mpox infectious period can vary, but it typically begins with the onset of symptoms and patients are considered infectious until new lesions have stopped appearing, existing lesions have crusted, scabs have fallen off lesions that formed scabs, and fresh, healthy skin can be seen where lesions used to be. This may generally take from 2 to 4 weeks, but some patients have been found to have persistent lesions for much longer [36][46]. There are studies that have also suggested that some patients might be infectious before symptom onset [22][81][82][83]. The potential for pre-symptomatic transmission remains unclear and more research is needed.

1.6.7 Wastewater surveillance

MPXV can be detected in wastewater and guidance for wastewater and environmental surveillance for MPXV is available from WHO [\[84\]](#). The virus present in mucosal and skin lesions can be released into grey water during activities including brushing teeth, hand washing, bathing, and from excretions into toilets [\[57\]](#). There is no known case of mpox infection resulting from contact with contaminated wastewater to date [\[57\]](#).

2 Methods used to develop this guideline

2.1.1 Types of recommendation made

The types of recommendations and statements used in this guideline are given in Table 2-1. The methods are described in detail below.

2.1.2 Guideline perspective

In making recommendations, the GDG (see [Acknowledgements](#)) primarily took an individual patient perspective. Population, public health, and systems perspectives were also considered, in which issues of feasibility were particularly relevant. These recommendations are complementary to those for vaccine deployment which is not considered in this guideline.

2.1.3 External and internal review

An external review group reviewed the final guideline to identify factual errors, and to comment on clarity of language, contextual issues and implications for implementation. The technical unit collected and managed DOIs of the external reviewers.

The guideline was finally reviewed and approved by the WHO Guideline Review Committee.

Table 2-1. Statements providing guidance within this document

Type	Explanation
GRADE-based recommendation	Recommendations are labelled and colour coded according to the direction and strength of evidence according to the GRADE framework.
Guiding principles (general medical principles and “good practice statements”	General normative statement based on accepted professional ideals, norms and standards in clinical and public health healthcare context. Within this document, the term “General medical principle” is used. Within the GRADE framework, these are referred to as “good practice statements”
Guidance from other WHO documents	Recommendations identified from other WHO guidance which were judged by the GDG to be sufficiently direct to allow application to patients with mpox, including additional remarks and evidence-to-decision considerations where required. Statements from the Clinical management and infection prevention and control for monkeypox: interim rapid response guidance (10 June 2022) are maintained in this text unless they have been reconsidered or updated.

2.1.4 Methods used in the interim guidance (2022)

This guideline was developed according to the standards and methods described in the WHO Handbook for guideline development [\[85\]](#). Initial content was derived from the Clinical management and infection prevention and control for monkeypox: interim rapid response guidance [\[1\]](#) which was written to respond to the 2022 Public Health Emergency of International Concern (PHEIC). Multiple recommendations were based on “best practice”, and not formal considered using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) process.

2.1.5 Methods used in the May 2025 update

In response to the second PHEIC (declared 04 August 2024 [\[2\]](#)), topic areas from the initial guidance were prioritized for update by the WHO mpox Steering Committee, and the Safe Scalable Care

Cluster in the mpox Incident Management Support Team. For prioritized questions, the GRADE approach was followed in producing recommendations.

Several prioritized interim statements from the 2022 guidance were not evaluated by systematic review, as they were considered by the GDG as “Good practice statements” within the GRADE framework, as implementation considerations, or were programmed for later update. Two GDGs were formed, which considered “clinical management” and “infection prevention and control” within their respective areas of expertise. Additionally, two expert groups were formed and consulted by the methodologist and WHO technical teams to discuss and interpret available evidence on [ART initiation](#) [86], and [breastfeeding](#), and to facilitate presentation of this evidence to the clinical management GDG.

While all perspectives and viewpoints were welcome in the discussions, the formulation of the recommendations for IPC were made specifically by the respective IPC GDG members; and in the clinical management GDG meetings only clinical management GDG members were responsible for making recommendations.

The Steering Committee and GDG reviewed existing interim recommendations and agreed to retain them, explicitly labelled, to ensure a consolidated and single-sourced guideline.

2.1.6 Methods used in the February 2026 update

Two recent randomised controlled trials demonstrated no efficacy of the most immediately promising mpox antiviral (tecovirimat) [87][88]. However, the PALM007 study of clade I mpox performed in the Democratic Republic of the Congo demonstrated lower mortality than expected compared with historical data (the study mortality was 1.7% in both placebo and tecovirimat arms). It is likely that high-quality supportive care has an important role in improving outcomes; the 2025 update focuses on these aspects. A systematic search was performed to identify potential packages of interventions (see Annex 8). Only the PALM007 protocol of care was sufficiently detailed to allow an understanding of the interventions and outcomes. However, methodological limitations meant there were insufficient data to demonstrate the contribution of the package on outcomes. The WHO steering committee therefore recommended using the PALM007 framework, but disaggregating into component parts, and forming recommendations based on consideration of those with the highest potential for impact.

2.1.6.1 *Collecting evidence and source documents*

Due to the necessity to respond rapidly to the PHEIC, no new systematic reviews were commissioned. Instead, the guideline update followed the following steps to collect evidence:

Consideration and categorization of each PALM007 supportive care element by the technical team as one of:

- a general healthcare principle;
- an intervention already addressed by the GRADE approach in previous iterations of this guideline;
- an intervention already addressed by another WHO guideline, potentially intended for a different population;
- elements not in any of the above (undetermined)

Presentation of undetermined elements to current and previous GDG members, and to an open webinar. Participants were asked to identify the five clinical questions which, if demonstrated to have any effect, would most affect patient outcomes.

Using the single transferable vote method, screening of the overall most important (from 48 GDG and 85 webinar respondents) for availability of systematically reviewed evidence in the published literature by the methodology team.

Assessment of each systematic review for relevance, completeness and recency by the methodology team.

2.1.6.2 *Evaluating evidence and source documents*

The GDG was held in Nairobi, Kenya from 10-12 June 2025, systematically addressing each element of the supportive care elements. Recommendations were written by consensus on the basis of non-objection. Indicative voting could be used, but formal voting was not used.

Confirmed which general healthcare principles should be adopted. From the proposed list of 63 statements, 62 were agreed, with suggested minor wording modification from the original text.

Used evidence on prioritized questions according to GRADE methodology to formulate new recommendations.

Evaluated existing WHO recommendations for indirectness and other considerations according to GRADE evidence-to-decision framework and making a decision to include or exclude on the basis of applicability.

2.2 Guideline Development Group

WHO selected GDG members to ensure global geographical representation, gender balance, appropriate technical and clinical expertise including community and patient representatives.

2.2.1 Declarations of interest

The WHO technical unit collected and managed DOIs using a written declaration from each proposed GDG member, additional verbal declarations at each meeting and web searches according to WHO processes. No significant conflicts were found, and the details are given in [Annex 9](#).

The technical unit also collected and managed DOIs for systematic review team members; no relevant conflicts were identified.

2.3 GRADE-based recommendations

2.3.1 Evidence synthesis

When performed de novo, systematic review teams conducted rapid systematic reviews independent of the GDG to identify published literature and the benefits and harms of the interventions. The teams comprised experts in systematic review, clinical care and biostatistics.

2.3.2 Presentation of evidence and assessment of certainty

Absolute benefits and harms for all patient-important outcomes were presented, including effect estimates and confidence intervals. Narrative summaries [89] were used if these data were not available.

Certainty of evidence was assessed using GRADE as outlined in the WHO Handbook for guideline development [85][90][91]. This considered the risk of bias/study limitations, inconsistency, imprecision, indirectness and publication/reporting biases [92].

2.3.3 Evidence to decision framework

Considerations within the evidence to decision framework are: the balance of benefits and harms; patient values and preference; acceptability; feasibility; and resource implications [93].

For the values and preferences of patients towards potential interventions, expected values and preferences were informed by: 1) the GDG members' own experience; 2) primary research and systematic review on behaviour and attitude to mpox treatments and IPC practices, including WHO commissioned research [94]; 3) patient experience as related within a structured mpox webinar series [95]. The latter included presentations from patients affected by mpox, and were attended by multiple members of the GDG.

For each PICO, the methodology team and GDG chairs met before the GDG meeting to clarify the presentation of evidence, and to identify expected key considerations within the evidence-to-decision framework. Where necessary, additional information was sought which could further inform the GDG.

2.3.4 Formulating recommendations

Discussion and inclusion of all members at GDG meetings was facilitated by the chairs and methodology co-chairs in order to establish the direction, strength and wording of recommendations, including additional remarks. Decision-making by consensus was strongly preferred, and the use of voting was minimized to where this could not be achieved. In such cases, a pre-specified decision rule for making a strong recommendation of 70% of eligible GDG members was used, and results are made explicit in the guideline.

2.4 Implementation guidance

Implementation considerations describe the “who, what, when and how” of implementing recommendations and statements. They include tools and strategies relevant to supporting the implementation of the intervention but may not necessarily have a clear link to evidence.

In this guideline, implementation considerations translate standard and transmission-based precautions into practical guidance for managing mpox [96]. Many of these considerations are derived from WHO documents such as the Transmission-based precautions for the prevention and control of infections: aide-memoire [96] and the Standard precautions for the prevention and control of infections: aide-memoire [97] along with generic recommendations adapted to mpox transmission modes. These were evaluated and validated by the GDG.

2.5 Guiding principles: general health care principles and "good practice statements"

WHO considers guiding principles to be statements which can guide professional responsibilities, ideals and standards in the context of the clinical and public health systems, based on formal and informal norms [98] and/or on particular morality. Formal norms are codified, such as in professional codes of practice or conduct, whereas informal norms are based on accepted practice.

In the context of this guideline, general health care principles were accepted if there was unanimous acceptance by the GDG that they were accepted practice.

Good practice statements are analogous concepts within the GRADE framework. These were made in the 2022 and May 2025 guidelines only. Good practice statements in the document for IPC were reviewed with the methodologist and GDG chairs to determine if they met the criteria below, and then presented to the panel for discussion and consensus.

Good practice statements are necessary, actionable and clear guideline statements that are important but do not warrant formal ratings of evidence quality. Formulating a good practice statement includes adhering to five principles:

- Is collecting and summarizing the evidence poor use of the panel's limited time, energy and resources?
- Is the message necessary for health care practice?
- Does implementing the good practice statement unequivocally result in a net positive consequence?
- Is there a well-documented and clear rationale connecting to the indirect evidence?
- Is the statement clear and actionable?

2.6 Importing and adapting existing WHO guidance

The technical team searched for existing WHO recommendations pertaining to elements of supportive care, including by approaching other WHO subject matter experts where necessary. Information was extracted from the existing guideline including: whether GRADE methodology was used; year of publication; evidence certainty, strength of recommendation; population addressed; and relevant text. The GDG were asked to explicitly consider the degree of indirectness to mpox patients, evidence-to-decision considerations (patient values and preferences, resource use, equity, acceptability and feasibility) and the relevance to home-based care/facility-based care and different age groups.

2.7 GDG topic-specific working groups

The process to develop this updated guideline was based on a structure that consisted of two working groups that functioned as GDG: one on clinical management and one on IPC, engaged to specifically consider recommendations within their domain of expertise, i.e. the IPC working group primarily formulated IPC recommendations, while the clinical management working group focused on clinical management.

There were also two technical groups: one on HIV and one on breastfeeding. Both included some of the GDG members and several additional topical experts that were not GDG members (see Acknowledgements). They worked on bringing up the considerations of these topics to be presented to the GDG members who were responsible for making the final recommendations for the guidelines.

While all perspectives and viewpoints were welcome in the discussions, the formulation of the recommendations for IPC were made specifically by the respective IPC GDG members; and in the clinical management GDG meetings only clinical management GDG members were responsible for making recommendations.

2.7.1 Infection prevention and control technical working group

The IPC working group members convened for three separate meetings (27 November 2024, 10 December 2024 and 21 January 2025) to review available evidence and formulate the recommendations, good practice statements and implementation considerations contained in this document.

Evidence synthesis

A commissioned systematic review underpins the current guideline and is an update of a previously published systematic literature review. The systematic review performed in 2023 assessed publications up to and including September 2022. A subsequent review was commissioned in 2024 given the evolution of new MPXV clades. Both reviews synthesize and update evidence for the three research questions outlined below and were developed in consultation with the GDG following the publication of the interim guidance in 2022.

1. Does the use of respirator versus a medical mask when interacting with a patient with suspected or confirmed mpox during the infectious period (as defined in the footnote) reduce occurrence of mpox in health and care workers in a household, congregate living or health care setting?
2. Does the use of an airborne precaution room versus an adequately ventilated room in a health care facility for a patient with mpox during the infectious period (as defined in the footnote) reduce the occurrence of mpox in health and care workers?
3. In the event that a person with non-severe mpox is being cared for at home, does isolating the person with non-severe mpox until all lesions are fully healed reduce occurrence of mpox in persons who are contacts, compared with not isolating when the patient wears a medical mask, covers all unhealed lesions, refrains from close contact and does not share any materials that could be contaminated?
3. The reviews occurred in two stages. The first stage appraised available evidence from comparative interventional trials, which yielded no evidence. In the absence of such data, the second stage was performed to synthesize evidence on the reported routes of MPXV infection using non-comparative study designs to indirectly inform the three IPC intervention review questions. Details on the search strategy and key terminology can be found in Annex 5: Search strategy and terminology for reported routes of MPXV infection.

Throughout these discussions, research gaps were identified, prompting the development of the IPC research agenda and ongoing research prioritization efforts (see: Uncertainties, emerging evidence and future research).

2.7.2 Breastfeeding technical working group pre-GDG discussion

WHO convened a technical meeting with experts on 26 November 2024 to guide the review of relevant evidence and to support the update of recommendations concerning breastfeeding and mpox. The technical working group included external experts with experience in infant feeding and nutrition, paediatric care, with wide geographical representation and gender balance. The full meeting report can be found here [\[187\]](#).

A summary of synthesized evidence on the following PICO questions that relate to breastfeeding during and after recovery from mpox infection was presented and discussed:

- Should a mother with suspected/confirmed mpox and no lesions on the breast continue breastfeeding and direct contact with their non-infected infant?
- Should a mother with confirmed mpox and active lesions on the breast continue breastfeeding and direct contact with their non-infected infant?
- When after recovery from confirmed mpox (after stopping breastfeeding and close contact) should the mother resume breastfeeding and direct contact with their non-infected infant?
- Does pasteurization inactivate mpox in breastmilk to allow feeding the infant with expressed milk without direct contact with mother with mpox?

Overall there were very few studies to answer the four PICO questions. Identified studies were mostly observational, non-comparative study designs and with significant methodological limitations.

The meeting points are summarized below, and were presented to the GDG for further discussion and interpretation.

2.7.2.1 Routes of transmission

The TWG reiterated that guidance on breastfeeding and infant contact in mpox infection needs to differentiate between the following potential MPXV routes of transmission from mother to child:

- through breastmilk (presence and viability of virus in breastmilk is unknown)
- direct contact during the process of breastfeeding (from the breast)
- other direct contact with the infant (not from the breast) during care
- air droplets
- saliva through kissing.

2.7.2.2 What are the evidence gaps?

- It is still unknown if MPXV is secreted in milk although laboratory experiments have shown that it can be viable in milk. This was thought to be the first critical question because if studies show that breastmilk does NOT contain MPXV, then this would help to answer the question if breastfeeding should be recommended and if so how?

- If mpox can be transmitted via breastmilk, then there would be need for an additional PICO, whether heat treatment of expressed breastmilk can make it safe [?] and what is the feasibility of this intervention at an individual and population level.

What are the implementation considerations?

- There is a need to involve, where possible, another caregiver to take care of the infant particularly for mothers that are in isolation to limit the duration of contact with between the infant and a mother with mpox.
- The duration of infant-to-mother contact will vary depending on the age. Early initiation of breastfeeding requires longer contact, and later the infant may need shorter contact during breastfeeding. A newborn (up to 2, 6 or even 8 weeks) usually needs constant access to the breast to successfully breastfeed.
- A lesion on the areola would make breastfeeding very painful, and therefore for breast health, the mother should express from that breast in order to prevent engorgement or mastitis and preserve lactation for later resumption of breastfeeding.
- Alternative milk substitutes may not readily be available, or not affordable, or not safe in many locations.

2.7.3 HIV antiretroviral technical working group pre-GDG discussion

WHO convened a technical meeting with experts on 15 November 2024 to discuss and interpret the available evidence on ART initiation in people living with HIV and mpox. Participants included HIV medicine experts, infectious diseases specialists, and programme managers with significant mpox experience; a full list of participants and meeting report can be accessed here [\[188\]](#). The technical meeting was led by an independent chair.

The objective of the meeting was to identify the evidence sources that would best inform the GDG and place these in the context of the current WHO guidelines that include a strong recommendation for rapid ART initiation, with the option of same-day initiation, in people living with HIV. To facilitate discussions, a literature review compiled by WHO technical staff summarized the available direct and indirect evidence.

The meeting reported the following findings, which were presented to the GDG for further discussion and interpretation.

2.7.3.1 *ART initiation in people living with HIV with mpox*

- ART is a life-saving intervention for people living with HIV, with or without mpox virus infection.
- Rapid ART initiation (within 7 days of HIV diagnosis) or re-initiation is the standard of care for people living with HIV that are ART-naïve or have interrupted ART (WHO, strong recommendation). This includes people with opportunistic infections other than tuberculosis and central nervous system infections.
- Immune restoration through effective ART is important to control MPXV and delay in ART initiation may potentially be harmful.

- There is uncertainty about the incidence of mpox IRIS; mpox IRIS may occur but it is difficult to distinguish from progressive mpox given the lack of clear case definition, delayed clinical presentation and concurrence of other (opportunistic) infections.
- Central nervous system manifestations of mpox are estimated to be uncommon and based on clinical expertise not a reason to delay ART initiation provided that assessment of other aetiologies is conducted.
- The expert group proposed the values and preferences statement that “Most HIV patients with mpox would place a higher value on the mortality reduction benefit of initiating ART as soon as possible than on the possible increased risk of developing IRIS”.

2.7.3.2 What are the evidence gaps?

- Lack of direct evidence comparing rapid vs delayed ART initiation in people living with HIV and mpox. Only one small cohort study that directly addressed the question of timing of ART initiation was identified; this study did not show a difference in outcomes.
- Understanding progressive mpox, mpox IRIS and associated morbidity and mortality. There is limited evidence on viral pathogenesis, immune response and disease progression in people with and without ART initiation for HIV.

2.7.3.3 What are implementation considerations?

- Ensure all patients with presumed or confirmed mpox receive HIV testing at their first presentation to health care providers.
- Ensure individuals engage with health care services at an early stage of mpox symptoms to avoid disease progression and late ART initiation.
- Ensure clinical assessment is conducted in all patients prior to ART initiation to ensure comprehensive care of people living with HIV, in particular those with advanced HIV disease.

3 Infection prevention and control

3.1 IPC in home-based care

Public health emergencies often begin and end in communities; therefore, an effective emergency response always includes communities and their interests. This requires a multifaceted approach that includes, but is not limited to, risk communication and community engagement strategies, public health and social measures, vaccination strategies, environmental services such as adequate water and sanitation infrastructure, and the application of IPC measures [100][101][102][103].

Health ministries and intersectoral partners at national and subnational levels should engage with communities and other actors to identify and provide the resources needed, implement risk communication strategies [104] to provide support, and look to other contexts for possible solutions to ensure that IPC measures can be met to provide safe care in settings where patients will be cared for [105].

In the context of emergency response, it is crucial that community IPC and WASH measures are implemented to mitigate and control transmission in high-risk settings, such as households with suspected cases, communal settings, which include internally displaced persons (IDP) and refugee camps, and to ensure continuity of services such as schools. Infection prevention and control measures such as hand hygiene, dedicated personal items, handling of linen and laundry, environmental cleaning and disinfection and waste management, should be applied and adapted applied to community settings to mitigate and control transmission of mpox.

Previous guidance (2022) advised persons with mpox recovering at home to isolate themselves. Given the evolving evidence and perceived values and preferences of persons with mpox to avoid home isolation, the updated recommendation by the GDG reflects a shift away from isolation during home-based care, provided IPC measures can be implemented and maintained. Further research needs for IPC during home-based care are listed in the section Knowledge gaps and research priorities.

Infection prevention and control measures, including hand hygiene, dedicated personal items, appropriate handling of linens and laundry, cleaning and disinfection of the environment and waste management, should be followed for persons with mpox in the community until all lesions are healed.*

Good practice statement, May 2025.

** Healed lesions: lesions have crusted, scabs have fallen off and a fresh layer of skin has formed underneath.*

3.1.1 Implementation considerations

The person with mpox infection should wear a well-fitting medical mask and cover lesions when in close proximity to others until their existing lesions have crusted, scabs have fallen off lesions that have formed scabs, and fresh, healthy skin can be seen where lesions used to be.

The person with mpox infection recovering at home should be able to manage their self-care or identify a designated caregiver, preferably someone who is in good health, that has no underlying health conditions and has had previous smallpox or mpox vaccination or MPXV infection (see the conditional recommendation for home care for details for caregivers). The activities undertaken by caregivers may include preparing meals, going to the grocery store, getting medications, etc.

The person with mpox infection recovering at home should refrain from contact with wild or domestic animals to avoid infecting the animal. This includes keeping possibly infectious and contaminated material, such as linens, towels and clothing, away from pets and other animals. Another person should take care of domestic animals throughout the illness.

If a health and care worker is required to provide care to patients with mpox in the home, they should wear appropriate personal protective equipment (PPE) (gloves, gown, eye protection and medical mask), perform hand hygiene (according to the WHO 5 moments and before putting on and after removing PPE) and clean and disinfect any patient care equipment used.

3.1.1.1 Hand hygiene

Persons with mpox infection, and their caregivers or contacts should practise frequent hand hygiene [106]. This includes: 1) before preparing food; 2) before eating or feeding/breastfeeding; 3) after using the toilet or handling human and/or animal faeces; 4) after coughing, sneezing and/or disposing of a tissue; 5) each time they come in contact with their lesions; and 5) when hands are visibly dirty.

Alcohol-based hand rub or soap and water should be used for hand hygiene.

The person with mpox should have their own soap that they do not share with other household members.

3.1.1.2 Personal belongings

The person with mpox and their family and household members should implement the following measures:

- Avoid sharing personal items such as eating utensils, linens, towels, electronic devices.

- Avoid sharing a bed or sleeping area with other people or animals.
- Avoid direct contact with upholstered furniture, such as couches or chairs. Consider covering furniture with a clean sheet that can be laundered.

3.1.1.3 *Handling linen, laundry*

Only the person with mpox or their dedicated caregiver should handle and launder their bedding, clothing etc.

Linens and bedding should be carefully lifted and rolled to prevent dispersion of infectious particles from lesions and body fluids. They should not be shaken.

Linens, towels and clothing from the patient with MPXV should be laundered separately from other household laundry and can be reused after washing (manually or by machine) with detergent and preferably hot water (> 70°C) or in chlorine (a minimum of 0.05%) if hot water is not available [107].

3.1.1.4 *Environmental cleaning*

Only the person with mpox or their dedicated caregiver should clean and disinfect the environment and objects/surfaces.

Dishes and utensils and household surfaces, such as furniture, beds, toilets or floors, or any location where the patient has had contact should be cleaned with water and soap and disinfected regularly.

Common household disinfectants or sodium hypochlorite (household bleach) products may be used [108][109][110][111]. Disinfectants should be prepared and applied to surfaces according to manufacturers' instructions.

One study found that the use of a minimum of 0.05% sodium hypochlorite solutions or 70% ethanol is efficacious against MPXV when wiped on common non-porous surfaces in low-resource settings with a 1-minute contact time [108].

Use damp mopping, avoid dry sweeping to prevent dispersion of particles.

Carpeting and household furnishing should be steam cleaned where possible. Avoid vacuuming.

3.1.1.5 *WASH and waste management*

Authorities should ensure access to safe water, sanitation, hygienic supplies (soap and water) and waste collection and disposal for persons with mpox infection and their family members during home-based care.

Waste that is generated from caring for a patient with MPXV, such as bandages and PPE, should be placed in strong bags and securely tied before disposal and eventual collection by municipal waste services [107].

If municipal waste services are not available, as an interim measure and according to local policies, safely burying or controlled burning of waste may be performed until more sustainable and environmentally friendly measures can be made available in local contexts.

3.1.2 Rationale

The GDG emphasized the critical role of applying IPC principles at the community level to reduce community MPXV transmission. Members of the GDG highlighted the importance of implementing these IPC measures as a cohesive package of interventions, ensuring a multi-pronged approach to minimizing the spread of the virus. The GDG acknowledged the primary route of transmission is contact (sexual or non-sexual) with the skin lesions, with fluids or exudate from those lesions of individuals infected with MPXV. Given possible contamination of surfaces and objects as well as the potential for infectious respiratory particles, the risk of indirect contact transmission or direct deposition cannot be excluded. Standard and transmission-based precautions describe measures to reduce routes of transmission and are widely used in health care. The use of standard and transmission-based precautions is the cornerstone of IPC measures and the GDG noted these should be applied wherever there is human-to-human transmission [96]. GDG members also noted the important role that ministry of health and implementing partners at national and subnational levels play in engaging with communities to identify and provide the resources needed, implement risk communication strategies and provide solutions to ensure that IPC measures can be met.

WHO suggests that persons with mild, uncomplicated mpox lesions cared for at home are not required to isolate* provided their lesions are covered and they wear a well-fitting medical mask when in close proximity with others until all lesions are healed.**

Conditional recommendation, low certainty evidence, May 2025.

- Persons with mpox who are unable to comply with covering their lesions or wearing a medical mask should be isolated at home.
- IPC measures to reduce environmental contamination in the home should be implemented.

* Isolation: the separation of infected people with a contagious disease from people who are not infected.

** Healed lesions: lesions have crusted, scabs have fallen off and a fresh layer of skin has formed underneath.

3.1.3 Implementation considerations

For information on implementing IPC measures in a home/household setting refer to the good practice statement and its implementation considerations.

For persons with mpox recovering at home without implementing isolation, the following measures, in addition to the IPC measures described in the good practice statement, should be followed:

- Persons with mpox recovering at home should wear a medical mask (if a medical mask is not available, a fabric mask may be worn [101]) and cover their lesions when near others.
- Covering lesions can be done with the use of bandaging and/or by wearing clothing that comfortably covers the lesions.
- Clinical follow-up should be conducted using methods other than in-person visits (e.g. telemedicine, telephone).
- Regular cleaning and disinfection of the environment the person with mpox occupies and frequently touched surfaces should be implemented.
- Individuals with mpox should limit travelling outside their home.
- If a person with mpox leaves their home they should wear a well-fitting medical mask and ensure all lesions are covered.
- If they leave their home they should ideally use private transportation and ensure proper ventilation in the vehicle, such as open windows if feasible.
- If a person with mpox leaves their home to seek medical attention, they should inform their health practitioner or the facility they will visit in advance of arrival (so the facility can implement transmission-based precautions).
- The person recovering at home should be able to manage their self-care or identify a designated caregiver, preferably someone who is in good health, has no underlying health conditions and has had previous smallpox or mpox vaccination or MPXV infection (for example, this may include preparing meals, going to the grocery store, getting medications, etc.).
- If there is a designated caregiver they should maintain a distance of at least 1 m from the person with mpox.

- When distance cannot be maintained, or when conducting activities such as assisting with laundry or cleaning the environment, the designated caregiver should wear a well-fitting medical mask and disposable gloves [112].
- Caregivers should clean their hands with either soap and water or an alcohol-based hand sanitizer, before and after contact with the person with mpox or the environment and before putting on and after removing their gloves.
- In the event that persons with mpox cannot comply with wearing a mask and covering their lesions and therefore are required to isolate at home they should:
- Designate one person to facilitate their self-care: preferably someone who is in good health, has no underlying health conditions and has had previous smallpox or mpox vaccination or MPXVs infection. For example, this may include preparing meals, going to the grocery store, getting medications, etc.
- The person with mpox and the designated person that is facilitating self-care should be counselled regarding the risks of transmission.
- The person with mpox should stay in a dedicated, well-ventilated room (e.g. with windows that can be opened frequently) separate from others in the household. In addition, household members should avoid entering the room.
- If the designated person that is facilitating self-care needs to enter the isolation area, ideally with ensuite toilet and shower [112], they should refrain from close contact with the person with mpox.
- When distance cannot be maintained, the designated caregiver should wear a well-fitting medical mask and disposable gloves [112]. They should clean their hands with either soap and water or an alcohol-based hand sanitizer, before and after contact with the person with mpox or surrounding environment and before putting on and after removing their gloves.
- The person with mpox should cover lesions (if tolerable) and wear a well-fitting medical mask when in proximity of others, and when moving outside of the designated isolation area (e.g. to use the toilet).
- If adequate isolation and IPC measures cannot be ensured at home, then isolation may need to be arranged, with informed consent from the person with mpox and agreement from the caregiver and members of the household, in a health care facility or other designated facility.

* For more information on implementation in resource-limited settings refer to the Infection prevention and control and water, sanitation and hygiene measures for home care and isolation for mpox in resource-limited settings: interim operational guide (2024) [101].

3.1.4 Rationale

The GDG noted that while there were no randomized or observational randomized studies for isolation versus no isolation in the home and the low certainty of the evidence, inferences about the impact of isolation could be made on the basis of the transmission route. Over 200 studies with over 32 000 patients identified the primary mode of transmission as close contact (sexual or non-sexual) (data are not yet published but are available upon request). The review found that amongst 3331 individuals documented to be exposed in the household, of whom 134 were infected (4.02% secondary infection rate), most reported non-sexual close contact or sexual contact. Similarly, amongst 3643 individuals documented to have been exposed in community or communal settings,

of whom 91 were infected (2.5% secondary infection rate), most reported non-sexual close contact or sexual contact. It was not clear in many studies what protective measures, if any, had been taken. Only possible routes of transmission were described. The GDG noted that there were limited studies available that describe the different MPXV clades and there was some concern on the possible impact on transmission, which may differ depending upon the clade.

The available evidence from the 2023 and 2024 systematic reviews presented on human-to-human transmission supports close contact (sexual or non-sexual) with the lesions of an infected person as, overwhelmingly, the primary mode of transmission (see Introduction). The GDG acknowledged that while the main route of transmission is through direct contact (sexual or non-sexual) with the skin lesions (with fluids or exudate from those lesions of individuals infected with the MPXV), possible environmental contamination as well as the potential for IRPs cannot be excluded. The GDG determined that IPC measures to prevent close contact would be paramount to transmission prevention while including the additional measure of isolation at home could cause undue hardship. IPC measures include avoiding direct contact with the lesions, use of source control measures for any IRPs, and mitigating environmental contamination through the use of cleaning and disinfection.

Based on the discussion of the evidence, the benefits and harms associated with isolation at home, as well as concerns regarding resource, equity, feasibility and acceptability, the GDG formulated a conditional recommendation that includes covering the lesions and wearing a medical mask, in addition to IPC measures, to prevent environmental contamination rather than isolation of the individual.

3.1.5 Evidence to decision considerations

3.1.5.1 *Benefits and harms*

The use of isolation at home may reduce potential contacts and protect household members and vulnerable people in the community; however, there was insufficient evidence to determine this. On the other hand, isolation can lead to mental health challenges such as loneliness, anxiety and depression, amplify stigmatization and impose an economic burden due to absence from work or daily activities. Based on the available data and the evidence on the modes of transmission of mpox, the GDG determined the harms outweigh the benefits.

3.1.5.2 *Evidence*

The certainty of evidence was judged to be low and was rated down once for indirectness and once for risk of bias. The GDG noted that while there were no randomized or observational randomized studies for isolation versus no isolation in the home, inferences about the impact of isolation could be made on the basis of the epidemiological findings about the routes of transmission. Over 200 studies with over 32 000 patients identified the primary mode of transmission as sexual (95.4%) or non-sexual close contact (2.9%).

3.1.5.3 *Values and preferences*

Substantial variability is expected or uncertain

The GDG acknowledged that many individuals (persons with mpox) would prefer not to implement isolation because of the negative mental health, social and economic consequences. Values and

preferences may vary in family members and communities depending on their level of fear of getting mpox if the person is not isolated.

3.1.5.4 *Resources and other considerations*

The use of isolation at home may require significant operational and financial costs and support for the affected person with mpox, their family/caregiver and the health system. There may be costs and resource implications for the person with mpox or the health system to ensure access to medical masks and materials to cover lesions where isolation is not implemented.

3.1.5.5 *Equity*

The GDG acknowledged that there may be inequities in managing isolation at home, in particular in low- and middle-income countries, where support may not be available including social and financial and stigmatization may be increased.

3.1.5.6 *Acceptability*

The GDG noted that in some situations, the person with mpox or their family members may prefer to utilize home isolation to potentially reduce transmission within the household. However, others may find isolation unacceptable or difficult to implement.

3.1.5.7 *Feasibility*

The GDG acknowledged there may be issues with the feasibility of isolation at home as well as the wearing of masks and covering of lesions.

3.2 **IPC in health facilities**

Implementation of appropriate IPC measures is essential to mitigate and control risks of transmission of mpox in health care facility and community settings [113][114]. Implementing a hierarchy of controls is central to reducing the risk of exposure to mpox within health care settings. As such, considerations for the application of engineering and administrative controls and the use of PPE have been integrated throughout the recommendations outlined.

It is critical to ensure that basic IPC standards are put in place at the national and health facility level to provide adequate protection to patients, health workers, caregivers and visitors and thereby protect the community. WHO provides guidance on the minimum requirements [115] for IPC at the national level and in health care facilities. Achieving the IPC minimum requirements and more robust and comprehensive IPC programmes based on WHO Guidelines on core components of infection prevention and control programmes at the national and acute health care facility level across health systems is essential to sustaining efforts to control emerging infectious diseases, health care-associated infections (HAIs) and antimicrobial resistance [114].

Health and care workers should always follow standard precautions and perform a risk assessment to evaluate the need to use transmission-based precautions. Standard precautions are summarized in the WHO aide-memoire [97].

Infection prevention and control is crucial in mitigating and containing the spread of MPXV. If appropriate IPC measures are not taken, transmission can be amplified via health care-associated (nosocomial) [115] infections and/or health and care worker infections within health-care

settings [116]. This can result in further spread into communities and across borders, resulting in increased morbidity and mortality. Public health officials should ensure that robust IPC measures, environment infection control and practices accompanied by WASH services are in place at all health care settings, as well as in all communities, to mitigate these impacts. During an outbreak, support for IPC should include all relevant points of health-seeking practices within the local context, including government health facilities, private facilities, traditional healers and facilities such as mpox treatment centres established to manage the care of patients suspected of having or confirmed to have the pathogen of interest during an outbreak.

Strengthening IPC preparedness and operational readiness will lead to more robust responses, contain outbreaks and prevent health systems from becoming overwhelmed. Existing IPC capacity should be mapped and assessed (e.g. using the Health Emergency Readiness to Response Operations Capabilities checklist [HERO] tool), identifying the critical areas that are missing or that need development. Additional information can be found in the [Framework and toolkit for infection prevention and control for outbreak preparedness readiness and response at the national level](#) [116] and the [Framework and toolkit for infection prevention and control in outbreak preparedness, readiness and response at the health care facility level](#) [117].

Outbreak management is optimal where established national or subnational IPC programmes exist, with dedicated support and trained IPC teams at the national, local and health care facility level. Although MPXV has specific IPC considerations, standard and transmission-based precautions should be followed when caring for suspected or confirmed mpox patients.

All patients with mpox should receive respectful, patient-centred care that respects and promotes gender equity, maintains dignity, privacy and confidentiality [1].

Further research needs for IPC focusing on understanding transmission routes and IPC measures in health care settings are listed in the section Knowledge gaps and research priorities.

In patients with suspected or confirmed mpox, WHO suggests that health and care workers use contact and droplet precautions.

**Conditional recommendation, low certainty evidence, May 2025.*

- Consider using a respirator when the ventilation is poor or unknown or based upon a risk assessment (e.g. immunocompromised status or presence of mucosal lesions).
- Airborne precautions should be implemented if varicella zoster virus (i.e. chickenpox) or measles are suspected and until they are excluded.
- Airborne precautions should be implemented when performing aerosol-generating procedures (AGPs).
- If single rooms are not available or in limited supply, cohort confirmed patients and prioritize single rooms for suspect and probable patients.

*Note: * Contact precautions include the following PPE: gloves, gown. Droplet precautions include the following PPE: a medical mask, consider eye protection based upon a risk assessment.*

*** Confirmed mpox means via laboratory confirmation; probable meets clinical signs and symptoms with epidemiological link.*

3.2.1 See infographics

- [Steps to put on personal protective equipment \(PPE\) for mpox](#)
- [Steps to remove personal protective equipment \(PPE\) for mpox](#)

3.2.2 Implementation considerations

Contact and droplet precautions should be used by all health and care workers providing direct or indirect care (e.g. cleaning the environment, handling linen or waste) to patients with mpox.

In addition to droplet and contact precautions, standard precautions should be followed for all patients at all times. The measures described below provide additional considerations for implementing droplet and contact precautions [\[96\]](#) in the context of mpox.

Health and care workers should be trained in the use of standard and transmission-based precautions such as contact and droplet precautions and the proper use of PPE.

3.2.2.1 Risk assessment

Health and care workers should conduct a risk assessment to determine if additional PPE is required, such as a respirator rather than a medical mask and eye protection. The risk assessment should take into consideration: 1) the ventilation rate of the room and if an AGP is being performed; or 2) other activities are taking place that may increase the presence and risk of infectious respiratory particles, such as changing the bed linen of a patient with suspect or confirmed mpox; and 3) the patient's condition (e.g. number of lesions, location, i.e. mucosal, and patient's immune status).

3.2.2.2 Hand hygiene

Hand hygiene should be performed according to the WHO 5 moments for hand hygiene [\[118\]](#).

3.2.2.3 Patient placement

- Place patients on contact and droplet precautions for mpox in a single room.
- If a single room is not available or single rooms are limited:
- patients suspected to have mpox and patients deemed as probable mpox cases should be prioritized for a single room;
- consider cohorting patients who are confirmed to have mpox.
- Physically separate patients by at least 1 m (3 ft) and draw privacy curtains.

Whenever others are in the room and if transport is necessary:

- Cover any wounds or lesions on the patient's body through the use of bandages, clothing and/or sheet that comfortably covers the lesions.
- The patient should wear a wear a medical mask (if able and tolerates) and follow respiratory hygiene and cough etiquette.

3.2.2.4 Personal protective equipment

- Contact and droplet precautions include the following PPE: gown, gloves, medical mask and eye protection based upon a risk assessment.
- Consider a respirator instead of a medical mask based on a risk assessment (details above).
- Use dedicated footwear that can be decontaminated. Disposable shoe covers are not recommended.

3.2.2.5 Safe injections and sharps injury prevention

- Follow standard precautions for safe injections and sharps injury prevention.
- Avoid use of sharp instruments for specimen collection. Lesions should be swabbed. Follow WHO guidance for diagnostic testing for MPXV.

3.2.2.6 Environmental cleaning and disinfection

- Increase cleaning and disinfection of mpox patient care areas to at least twice daily as well as immediate cleaning and disinfection of any surface that is visibly soiled with blood or body fluids.
- More frequent cleaning and disinfection should be performed on frequently touched surfaces including toilets, latrines and showers.
- Clean first with detergent and water then disinfect surfaces with a chemical disinfectant and allow disinfectant to remain untouched on surface for the contact time recommended by the manufacturer. Alternatively, a combined detergent-disinfectant product (when available) can be used to perform both cleaning and disinfection in a single step, provided it is effective against the targeted pathogens.
- Use products for disinfecting the environments that are approved for environmental cleaning in health care with virucidal activities (follow national or facility guideline) and will not damage surfaces or equipment.
- Disinfectants should be prepared and applied to surfaces according to manufacturer's instructions:

- One study found that the use of 0.05% and 0.5% sodium hypochlorite solutions and 70% ethanol is efficacious against MPXV when wiped on common non-porous surfaces in low-resource settings with a 1-minute contact time [108].
- Quaternary ammonium compounds were found to achieve sufficient log reduction of the MPXV on non-porous surfaces only with a contact time of between 1–10 minutes (not on porous surfaces such as wood) [108].

3.2.2.7 Handling and transport of linen

- Handle soiled linen from patients with mpox carefully (with minimal manipulation or agitation) to prevent personal contamination and transfer to other patients.
- Carefully lift and roll linens. Do not shake linen or laundry.
- Linens should be carefully placed into designated containers or bag for transport to laundry services.
- Remove heavily soiled material (e.g. faeces) from linen, while wearing appropriate PPE, before placing it in the laundry bag.
- Laundry and linen may be decontaminated by manual or machine washing for at least 20 minutes with hot water (70°C, hot water mixed with detergent or hot water mixed with a low-concentration sodium hypochlorite solution (0.05%) [119].

3.2.2.8 Decontamination and reprocessing of reusable patient care items and equipment

- Use disposable or dedicated patient care equipment.
- Clean and disinfect equipment before use on other patients.
- Clean and disinfect or sterilize reusable equipment/devices according to the manufacturer's instructions, and national or international standards, using efficient methods and based on intended use.

3.2.2.9 Waste management

- Handle and treat bodily fluids and solid waste of patients with mpox as infectious waste.
- Segregate waste according to standard precautions (general waste, infectious waste and sharps) and place in appropriate bins at point of use.
- Management and disposal of waste (including PPE) should be performed in accordance with local regulations for infectious waste.

3.2.3 Rationale

The GDG noted that among more than 32 000 cases of infections there were no reports of transmission by inhalation, and only one case of self-reported droplet exposure, and thus concluded the use of a respirator possibly makes little or no difference in prevention of MPXV transmission compared with a medical mask. Amongst 1738 health and care worker documented exposures to mpox, of which there were 14 infections, 10 cases (71.4%) were identified as related to percutaneous injuries (needlesticks), one ocular exposure and three due to unspecified factors.

There may be situations where the use of a respirator is required such as during an AGP or if varicella zoster virus (chickenpox) or measles are suspected and until they are excluded. The GDG stressed that health and care workers should conduct a risk assessment to determine the need for a respirator or any additional PPE (e.g. eye protection). In areas where ventilation is poor or unknown or it is not possible to ensure adequate ventilation a respirator may be preferred.

The GDG also highlighted the importance of assessing the risk of transmission related to the status of the patient, noting the patient's condition (number and location of lesions, immune status) may increase the risk of transmission and should be taken into consideration during the risk assessment to determine the use of a respirator.

Given the primary mode of transmission described was close contact (sexual or non-sexual) this conditional recommendation for mpox should be considered in the context of accepted practices (transmission-based precautions) for IPC. The GDG acknowledged that while the main route of transmission is through direct contact (sexual or non-sexual) with skin lesions (with fluids or exudate from those lesions of individuals infected with MPXV), possible environmental contamination as well as the potential for IRPs cannot be excluded. A conditional recommendation was made to implement droplet and contact precautions when interacting with patients with mpox or their environment, in addition to the use of standard precautions. PPE, including gown, gloves and eye protection (based on a risk assessment) must be worn as per contact and droplet precautions.

3.2.4 Evidence to decision considerations

3.2.4.1 *Benefits and harms*

Small net benefit, or little difference between the alternatives

The GDG assessed the benefits and harms of respirator use; from a public health perspective, the GDG felt it was important to reserve respirators for situations where respirators are known to make a difference. The GDG also highlighted potential challenges in availability, particularly in low- and middle-income countries. Limited access in these settings may reduce supply in areas where respirators are essential. GDG members noted that other potential harms include the possible mental health consequences such as anxiety and stress related to wearing respirators.

3.2.4.2 *Evidence*

The certainty of evidence was judged to be low and was rated down once for indirectness and once for risk of bias. The use of a respirator possibly makes little or no difference in prevention of MPXV transmission compared with a medical mask.

3.2.4.3 *Values and preferences*

Substantial variability is expected or uncertain

The GDG anticipated that although health and care workers caring for patients with mpox will place priority on safety, when evidence does not support the effectiveness of an intervention, such as the use of respirators, most would decline use of the intervention. The GDG acknowledged the uncertainty and the likelihood of variability in the values and preferences of health and care workers. Furthermore, the GDG placed a high value on avoiding wasteful expenditure on interventions unlikely to be effective and thus on preserving resources for interventions with a higher certainty of benefit.

3.2.4.4 *Resources and other considerations*

The GDG anticipated that the use of respirators for the care of patients with mpox in health care facilities requires additional investment of financial and logistical resources (including fit testing), particularly impacting low- and middle-income countries.

3.2.4.5 *Equity*

The GDG acknowledged that health and care workers believe safety is a priority and respirators should be available; however, in low-resource settings supply may be limited and respirators need to be prioritized for other pathogens where it is known that they are required.

3.2.4.6 *Acceptability*

Some health and care workers may not like to wear a respirator and may prefer the use of a medical mask. Use of respirators has been associated with reports of communication barriers (verbal and non-verbal).

3.2.4.7 *Feasibility*

The GDG expressed concern over supply chain implications and availability of respirators where needed if they are used for pathogens where the evidence suggests they possibly make little or no difference in prevention compared with a medical mask.

For patients with mpox in isolation, measures should be put in place to support patient interaction with family and visitors to promote well-being.

From: Clinical management and infection prevention and control for monkeypox: Interim rapid response guidance, June 2022 [1].

- Visitors or caregivers should perform appropriate hand hygiene before and after entering/exiting the patient room, receive instruction and be closely supervised on the use (putting on and removal) of PPE for contact and droplet precautions.
- Vulnerable and high-risk individuals should be counselled regarding the risks in order to make an informed decision on whether to visit the patient.
- Alternate modes of communication such as video conference to be offered.

Staff with an occupational exposure to mpox should have an assessment and management plan.

From: Clinical management and infection prevention and control for monkeypox: Interim rapid response guidance, June 2022 [1].

- Health and care workers should notify infection control, occupational health and public health authorities of possible exposures to receive a medical evaluation and instructions on follow up.
- Health and care workers who have had an exposure to a person with confirmed mpox should undergo medical evaluation and consideration for possible interventions (vaccination or post-exposure prophylaxis [PEP]) under prospective data collection protocol or clinical trial.
- Health and care workers who have had an occupational exposure (i.e. not wearing appropriate PPE) do not need to be excluded from work if they are asymptomatic, but should undergo active surveillance for symptoms for 21 days post-exposure and be instructed not to work with vulnerable patients.
- These plans should be in accordance with national or subnational policies. The term national describes a government entity at national level and subnational describes any government entity below the national level (regardless of the political, financial and administrative design of the country) involved in the management of health workers in the context of mpox.

3.3 Management of the deceased patient

Handling of human remains of deceased individuals with mpox should be done with appropriate infection prevention and control measures.

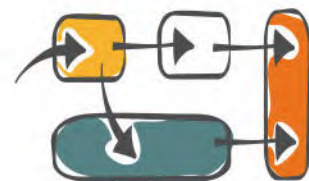
From: Clinical management and infection prevention and control for monkeypox: Interim rapid response guidance, June 2022 [1]. Revised May 2025.

- Handling of the deceased should be kept to a minimum.
- Perform hand hygiene and wear PPE according to contact and droplet precautions (gloves, gown, medical mask and eye protection based on risk assessment) as patients with rashes that have not healed may still have infectious virus.
- Airborne precautions should be implemented when performing AGPs.
- Ensure that any leakage of body fluids is contained.
- The body should be wrapped in a cloth or shroud and transferred to the mortuary as soon as possible.
- The dignity of the dead, their cultural and religious traditions, and their families, should be respected and protected. Family and friends may view the body after it has been prepared for burial, in accordance with local customs. They should not touch or kiss the body and should clean their hands with soap and water or alcohol-based hand sanitizer after the viewing.

3.3.1 Rationale

This recommendation derives from the Clinical management and infection prevention and control for monkeypox: interim rapid response guidance (2022), which recommended the use of airborne precautions in addition to droplet and contact precautions. In line with changes to guidance in V1.0, this recommendation has been revised to remove the stipulation for airborne precautions.

4 Organization of the care pathway



4.1 Screening

Screen for mpox using a locally adapted WHO case definition.

General health care principle, May 2025.

WHO mpox case definitions can be found here [\[120\]](#).

See WHO infographic: [Mpox screening tool for health workers](#). A screening protocol can be implemented at the point of entry to health care (primary care clinics, sexual health clinics, emergency departments, infectious diseases clinics, genitourinary clinics, dermatology clinics, maternity and paediatrics clinics and others).

4.2 Triage

Triage refers to the sorting of patients by priority after screening, based on specific criteria (e.g. severity) and can be performed at any point of access to the health care system, including in both pre-health care and facility-based settings [\[121\]](#) and in hospital wards, during monitoring of patients.

Use structured severity-based triage systems.

General health care principle, February 2026.

- WHO/International Committee of the Red Cross (ICRC) Interagency Integrated Triage Tool has been widely tested and adopted [122].
- Triage should be integrated with emergency action according to a structured ABCDE approach (see below).
- The GDG emphasized that structured severity-based triage is critical in mpox care to rapidly identify patients with life-threatening conditions and prioritize them for urgent treatment. Tools such as the WHO/ICRC Interagency Integrated Triage Tool, combined with the ABCDE approach, have been widely validated in multiple contexts and improve both patient flow and outcomes. While not mpox-specific, applying these established systems ensures timely and equitable care across all levels of the health system. See WHO infographic: [Mpox triage and clinical assessment for suspected and confirmed cases](#).

4.3 Clinical assessment

Timely identification of airway compromise, breathing difficulty, circulatory instability, altered mental status or exposure-related complications (e.g. secondary infection, burns) are critical to reduce morbidity and mortality.

Clinical assessment should also evaluate for signs and symptoms of severe or complicated disease, and for risk factors for severe disease [123].

Risk factors for hospitalization and death were identified based on a systematic review from 2024 [41]. HIV infection was significantly associated with death. See [Annex 7](#) for details. Additionally, children and pregnant people are considered high risk for poor clinical outcomes, although small numbers in existing data series mean that the degree of increased risk is uncertain. These vulnerable groups should be prioritised when designing and delivering clinical services.

Use a structured clinical approach to ensure emergency actions for life-threatening conditions.

From: *WHO Basic Emergency Care (BEC, 2018) [124], revalidated February 2026.*

- Adopt an Airway, Breathing, Circulation, Disability, Environment (ABCDE) approach.
- ABCDE should be followed by a rapid history using the SAMPLE approach (Signs and Symptoms, Allergies, Medications, Past medical history, Last oral intake and Events).
- See WHO infographic: [Mpox triage and clinical assessment for suspected and confirmed cases](#).
- A full set of vital signs (blood pressure, heart rate, respiratory rate, oxygen saturation) should be performed after the ABCDE approach. The ABCDE may need to be repeated at least every 15 minutes or with any change, depending on the patient's condition.
- Rapid measurement of physiological parameters is required for assessment including: blood pressure, heart rate, respiratory rate, peripheral oxygen saturation, capillary refill time/assessment of circulatory sufficiency, conscious level, blood glucose, temperature.
- The AVPU scale is a simplified assessment that can give you an indication of level of consciousness by assessing response to stimuli and is appropriate for use in adults and children.

4.3.1 Rationale

The GDG supported the adoption of this recommendation from the WHO BEC guidelines based on its widespread use, low resource requirements and critical role in early identification of life-threatening conditions [124]. Mpox can present with diverse symptoms and may lead to rapid deterioration, particularly in vulnerable populations such as young children, pregnant women, and immunocompromised individuals.

4.3.2 Evidence to decision considerations

4.3.2.1 Benefits and harms

Substantial net benefits of the recommended alternative

The ABCDE approach provides a structured, rapid and repeatable framework for early recognition and management of life-threatening conditions [124]. It supports clinical decision-making even in resource-limited settings and is adaptable for a wide range of emergency situations. There are no significant harms associated with using the ABCDE approach. Misapplication or poor training may lead to incomplete assessments.

4.3.2.2 Evidence

The approach is widely accepted and implemented in WHO emergency training packages, including the Basic Emergency Care (BEC) course and is supported by decades of use in emergency care for other conditions. This recommendation was adopted from the WHO BEC guidelines [124].

4.3.2.3 Values and preferences

No substantial variability expected

The GDG judged that health workers and patients value timely recognition of deterioration and need to administer life-saving interventions.

4.3.2.4 Resources and other considerations

No important issues with the recommended alternative

The ABCDE approach requires no special equipment and can be implemented by trained personnel across different cadres (e.g. doctors, nurses, paramedics). Training materials are already disseminated through the WHO BEC programme.

4.3.2.5 Equity

No important issues with the recommended alternative

The use of standardized emergency approaches would reduce inequities by ensuring that all patients, regardless of setting, receive systematic assessment. This is especially important in rural or resource-poor facilities, where provider expertise may vary.

4.3.2.6 Acceptability

No important issues with the recommended alternative

This recommendation would be highly acceptable to clinicians and patients as it aligns with established emergency medicine practice worldwide.

4.3.2.7 Feasibility

No important issues with the recommended alternative

Feasibility is high, as the ABCDE and SAMPLE approaches can be applied across all levels of the health system. They are straightforward to teach, simple to apply, and require limited resources.

In patients with mpox, perform a clinical evaluation to ensure that complications of mpox disease are elicited, and where present treated.

General health care principle, February 2026.

- Ensure the following are considered: dehydration, superinfection of skin lesions, secondary bacterial infections, neurological or respiratory involvement.
- See WHO infographic: [Mpox lesions differential diagnosis](#). Specific clinical evaluation will depend on the presentation. For example:
- Sepsis or septic shock: Identify and treat underlying causes such as bacterial skin infection, pneumonia or malaria.
- Myocarditis: Assess with physical exam, ECG, cardiac enzymes and electrolytes, where available.

4.3.3 Rationale

The GDG emphasized that mpox can lead to a range of complications including dehydration, superinfection of skin lesions, secondary bacterial infections and neurological or respiratory involvement, which are strongly associated with morbidity and mortality. While evidence from controlled trials is lacking, observational data and clinical experience show that poor outcomes often arise when these complications are not recognized or treated early. Ensuring that every patient undergoes systematic clinical evaluation helps identify complications promptly, supports timely treatment, focuses attention on common high-risk complications, helps prioritize limited resources for patients in greatest need, and provides a consistent standard of care across all health system levels.

WHO recommends all patients with mpox have their nutritional status assessed on admission and link to nutritional support or treatment of malnutrition as required. From: *WHO guidelines on nutrition (2023)* [125], revalidated February 2026.

- Use mid-upper arm circumference (MUAC) as a minimum assessment [125], but this cannot be used for monitoring purposes.
- Assessment of nutrition
 - Adults: history of reduced appetite or weight loss, body weight, height, calculation of body mass index (BMI), look for signs of malnutrition (e.g. muscle wasting, nutritional oedema etc.); a standardized tool can be used (e.g. Malnutrition Universal Screening Tool [126]).
 - Children: same as above plus mid-upper arm circumference (MUAC) (6–59 months). A nutrition specialist or trained clinician should evaluate children and those with severe malnutrition [127].
 - Paediatric mpox patients diagnosed with severe acute malnutrition should be treated according to the national protocol on management of severe acute malnutrition, or WHO guidelines on nutrition [125][128].

4.3.4 Rationale

The GDG noted that identification of nutritional status is a vital aspect of this initial assessment in order to ensure that children with severe wasting and/or nutritional oedema receive prompt and appropriate interventions. The GDG agreed with the WHO guideline on the prevention and management of wasting and nutritional oedema (acute malnutrition) in infants and children under 5 years (2023) [125] which directs that “Infants and children must be triaged as soon as they enter a health facility or have contact with a health worker in order to ensure that those with emergency or danger signs receive immediate life-saving care and that all others receive appropriate care as per their clinical status and classification.”

4.3.5 Evidence to decision considerations

4.3.5.1 Benefits and harms

Substantial net benefits of the recommended alternative

This recommendation was adopted from WHO guideline on the prevention and management of wasting and nutritional oedema (acute malnutrition) in infants and children under 5 years (2023). The GDG noted that this recommendation reflects WHO’s integrated management principles, including those from the Integrated Management of Childhood Illness (IMCI) [129] and Basic Emergency Care guidance [124]. Early identification of malnutrition can guide supportive care and prevent deterioration with timely interventions. Harms are anticipated to be negligible.

4.3.5.2 Evidence

This recommendation was adopted from: WHO guidelines on nutrition [125].

4.3.5.3 Values and preferences

No substantial variability expected

Providers and patients would value nutritional assessment as part of holistic care, and variability in preferences is likely to be minimal.

4.3.5.4 *Resources and other considerations*

No important issues with the recommended alternative

Nutritional assessment requires simple tools such as weighing scales, MUAC tapes and access to therapeutic foods or nutritional counselling. While these resources are generally inexpensive, gaps in supply or trained staff may exist in some settings.

4.3.5.5 *Equity*

No important issues with the recommended alternative

Routine assessment promotes equity by ensuring that vulnerable groups, such as children, pregnant women and immunosuppressed patients, are identified early and linked to support.

4.3.5.6 *Acceptability*

No important issues with the recommended alternative

The recommendation is likely to be acceptable to both patients and providers. Nutritional screening is non-invasive, quick and familiar to clinicians working in infectious disease or maternal and child health contexts.

4.3.5.7 *Feasibility*

No important issues with the recommended alternative

Feasibility is high, as assessment can be integrated into routine admission procedures. The main challenge is ensuring consistent access to therapeutic foods, micronutrients, and referral pathways. With proper supply chains and integration into existing nutrition programmes, implementation is straightforward in both inpatient and outpatient settings.

In patients with mpox, consult with senior staff and refer to specialists for specific high-risk conditions.

General health care principle, February 2026.

- This principle applies in mpox to:
 - High-risk and vulnerable populations (such as pregnant women, neonates and infants).
 - People living with HIV or other immunosuppression.
 - Mpox-related eye disease (e.g. eye pain, redness, lesions) or other complications such as myocarditis.
- Patients where initial treatment has been unsuccessful, or the patient is deteriorating, including but not limited to:
 - exfoliative dermatitis
 - severe infection.

4.3.6 Rationale

In applying this principle, the panel considered known at-risk groups based on systematic review of outcomes in mpox, or the potential for specialist care to provide specific additional assessment or treatment which cannot pragmatically be decentralized. This may require systems for transfer, telemedicine support, or regional referral networks. Ensuring referral for high-risk groups improves equity by prioritizing care for populations disproportionately affected by poor outcomes, such as pregnant women, neonates and immunocompromised patients.

Identify patients with any mpox-related risk factor and perform monitoring of vital signs and clinical status at a frequency dictated by the severity of illness and potential for deterioration.

General health care principle, February 2026.

- Risk factors in Annex 7 may be used to identify important predictors of poor outcome.
- Signs to monitor are explained in Annex 7.
- The GDG identified vulnerable groups who warranted more frequent assessment: age <5 years; pregnancy; advanced HIV; immunosuppression; malnutrition.

4.3.7 Rationale

The GDG highlighted that certain group, including young children, pregnant women, people with advanced HIV or other immunosuppression and those with malnutrition, are at higher risk of severe disease and poor outcomes from mpox. Prioritizing high-risk groups helps reduce inequities by ensuring vulnerable populations are not overlooked in crowded or resource-limited facilities.

In patients with mpox and agitation or altered mental status, evaluate for underlying causes and act promptly.

General health care principle, February 2026.

- Evaluation includes an ABCDE approach and measurement of vital signs.
- Complete a mental status and neurological examination.
- Ensure pain assessment.
- Test for and treat electrolyte imbalance.

4.3.8 Rationale

The GDG emphasized that agitation or altered mental status in mpox patients may signal serious underlying conditions such as hypoxia, hypoglycaemia, electrolyte imbalance, pain or neurological complications. Prompt evaluation using a structured ABCDE approach, vital signs, mental status and neurological examination, and targeted testing, enables timely diagnosis and intervention.

4.4 Testing for mpox

Please refer to WHO guidance on [Diagnostic testing and testing strategies for mpox \[130\]](#).

5 Interpersonal and psychosocial support



5.1 Mental health, and psychosocial support

Promptly identify and assess anxiety and depressive symptoms in the context of mpox, and initiate basic psychosocial support strategies and first-line interventions for the management of new anxiety and depressive symptoms.

From: Clinical management and infection prevention and control for monkeypox: Interim rapid response guidance (2022) [1], revalidated February 2026.

- Patients with mpox should receive compassionate, respectful, people-centred care consistently, while ensuring appropriate and adequate protection of household members, visitors and health workers.
- Ideally, a psychologist, social worker or nurse psychosocial provider fluent in the local language will be involved from the onset of the disease to counsel the patient on what will happen during any isolation. If this is not possible, then general nurses in the health centre should be trained and supervised to provide basic psychological support, using standardized resources.
- For people who are experiencing symptoms of depression, brief psychological interventions based on the principles of cognitive behavioural therapy (CBT), problem management and relaxation training can be considered [131]. Consider using remote mental health support (i.e. telephone therapy) when access to regular services is disrupted.
- If a person's anxiety or depressive symptoms persist beyond recovery from mpox, then an underlying anxiety or depressive disorder may be suspected, and a mental health professional should be consulted, and these conditions should be managed appropriately. Refer to the mhGAP humanitarian intervention guide for mental, neurological and substance use disorders in non-specialized health settings [132][133].
- It is important to ask about thoughts or acts of self-harm, particularly during mpox, due to risk factors for self-harm and suicide, such as sense of isolation, loss of a loved one, job, or financial loss and hopelessness. Remove possible means of self-harm, activate psychosocial support, follow up with the person and consult a mental health professional as necessary. Refer to the mhGAP humanitarian intervention guide for mental, neurological and substance use disorders in non-specialized health settings [132][133].
- CBT with a trauma focus, eye movement desensitization and reprocessing or stress management should be considered for adults with post-traumatic stress disorder (PTSD) [132][134].

The WHO Psychological first aid: guide for field workers and Inter-Agency Standing Committee guidance on basic psychosocial skills [134][135] promote care according to the following principles:

- Provide non-intrusive, practical care and support.
- Assess needs and concerns.
- Help to address basic needs (food, water, information).
- Listen to patients and families, but do not pressure them to talk.
- Provide accurate information on the patient's condition and treatment plan in easily understood and non-technical language, as lack of information can be a major source of stress.
- Help people address urgent needs and concerns and help with decision-making as necessary.
- Comfort patients and families while helping them feel calm. Inform them that the vast majority of mpox patients survive, so be sure to communicate to patients and their families that recovery is expected.
- Help people connect to information, services and social supports. Information about mpox is important as it helps to dispel myths, share clear messages about healthy behaviour and improve understanding of the disease.
- Encourage patients and caregivers to use evidence-based stress management and self-help tools such as the WHO stress management guide Problem management plus (PM+) [136].
- Following recovery, patients may suffer from lingering scars or disfigurement and psychological distress as a result. Psychological and social care should be included in the follow-up care plan and as part of a multidisciplinary team of care.

5.1.1 Rationale

The mpox outbreak can lead to significant mental and psychosocial effects, similarly as observed in COVID-19 and Ebola virus disease, [135][136][137], including:

- Fear of the disease or death, loss of sense of meaning of life, or loss of faith.
- Physical and social isolation from family or community.
- Stigma associated with diagnosis and returning to the community.
- Scarring and disability (e.g. blindness) associated with the disease.
- Basic psychosocial support skills are essential for management of all patients and represent an integral part of care that should be provided for all.

5.2 Communication

Initiate basic psychosocial support strategies before admission and maintain them throughout care.

General health care principle, February 2026.

- Before admission, explain clearly to the patient:
 - The purpose of isolation.
 - The nature of mpox illness and its treatments.
 - The layout and routines of the isolation facility.
 - Precautions that should be taken to prevent the disease from spreading.
- During admission, regularly engage the patient in supportive conversation. Health workers should:
 - Check in daily and listen actively.
 - Answer any patient questions.
 - Allow expression of fear, distress or frustration, especially regarding isolation.
 - Promote safe visits and frequent contact with family or community. This may include telephone or video calls. Within the boundaries of patient autonomy and confidentiality, families should be updated on the patient's condition and clinical progress. Simple approaches such as active listening, providing clear explanations and enabling family presence can be delivered without significant financial investment. More structured interventions, such as professional counselling or the inclusion of psychologists or social workers, would require greater resources.

Use psychosocial support strategies as the first-line interventions for management of sleep problems in the context of acute stress.

From: Clinical management and infection prevention and control for monkeypox: Interim rapid response guidance (2022) [1].

- Sleep hygiene advice (including avoiding the use of psychostimulants such as caffeine, nicotine or alcohol) and stress management (including relaxation techniques and mindfulness practices) are effective in reducing sleep problems and may be offered. Psychological interventions based on the principles of CBT may also be considered.
- For people who are hospitalized for mpox, additional causes of insomnia may include environmental factors (e.g. excessive light and noise at night), anxiety, persistent cough, delirium, agitation or pain. Identifying and promptly addressing underlying causes should be prioritized before using any pharmacological sleep aids.

Counsel patients with mild mpox about signs and symptoms of complications that should prompt them to urgently seek health care.

General health care principle, February 2026.

- Communication between the patient and trained health workers, should be established for the duration of the home-based care period.
- Monitoring patients and caregivers in the home can be done by trained community workers or outreach teams by telephone, telemedicine or email initially on a daily basis (when possible) or as considered clinically necessary after initial assessments. The patient's willingness to engage in medical assessments should also be considered.
- Patients with mpox infection and their families should be counselled about the signs and symptoms of complications and how to recognize a deterioration in their health status that requires medical attention. For example, patients should be informed to contact their health worker immediately if their lesions get worse or increase in quantity, if they develop worsening pain, persistent fever, nausea or vomiting and decreased oral intake, visual symptoms, difficulty breathing or dizziness or confusion.
- If a pregnant person has chosen to be cared for at home, counsel the person about maternal, fetal and newborn signs and to seek care if they develop worsening illness or danger signs. Self-care interventions should be encouraged.
- Counsel about healthy behaviours including diet, physical activity, intake of micronutrients, tobacco alcohol and other substance use, per WHO recommendations on antenatal [\[138\]](#) and postnatal [\[139\]](#) care.
- Link the person to employment, education, social services (including housing) and other relevant sectors.
- For people requiring abortion services, consider alternative modes of service delivery, including self-management of medical abortion up to 12 weeks' gestation, where there is access to accurate information and to a health care provider at any stage of the process, per the WHO Abortion care guideline [\[140\]](#).

5.3 Sexual activity

Advise patients to abstain from sex and close physical contact until ALL skin lesions from mpox have crusted, the scabs have fallen off and a fresh layer of skin has formed underneath.

From: Clinical management and infection prevention and control for monkeypox: Interim rapid response guidance (2022) [1].

- For patients who are sexually active: among persons presenting with rash or skin lesions that are suspected to have mpox, co-infection with other STIs should also be considered. The patient should have the following assessment:
 - Thorough sexual history.
 - Full physical examination using appropriate IPC measures with special attention on examination for: lymphadenopathy; rash or skin lesions in oral mucosae, genitals, ano-genital region, and other parts of skin.
 - Testing should be performed for HIV, syphilis, genital HSV, and screening for STIs and managed per WHO Guidelines for the management of symptomatic sexually transmitted infections [141]; patients should be encouraged to use condoms consistently during sexual activity for prevention of HIV and other STIs but should be made aware that the use of condoms alone cannot offer protection against acquisition and transmission of diseases.
- For persons living with HIV, particularly those with poorly controlled disease, who have mpox may be at greater risk for severe disease [36]. Data suggest they may be at risk for genital ulcers, secondary bacterial infection and prolonged duration of illness [38].
- If a person living with HIV is diagnosed with mpox, they should continue ART as before (see recommendation above of rapid initiation of ART in people with mpox and HIV who are ART naïve or have had a prolonged interruption of ART) [142]. People with lower CD4 counts are at greater risk of complications related to mpox so should be prioritized for starting ART [142].
- Should a person be diagnosed with both mpox and HIV at the same time, address the most urgent issues and treatment for mpox and consider drug-drug interactions.

5.3.1 Rationale

The GDG acknowledged that the risk of transmission from direct contact with infected skin or mucocutaneous lesions can amplify transmission, and thus abstaining from sexual activity during the infectious period would curtail transmission. As well, the potential for sexual transmission is unknown and subject to further research.

Note: This recommendation is based on existing WHO recommendations from Clinical management and infection prevention and control for monkeypox: interim rapid response guidance (June 2022) [1].

Based on the precautionary principle, WHO suggests the use of condoms consistently during sexual activity (receptive and insertive oral/anal/vaginal) for 12 weeks after recovery to prevent the potential transmission of mpox.

From: *Clinical management and infection prevention and control for monkeypox: Interim rapid response guidance (2022)* [1].

- As there are no available data about after recovery sexual mpox transmission, the precautionary principle is being applied for this public health intervention. As more information becomes available and our understanding related to transmission improves the guidance will be updated accordingly.

5.3.2 Rationale

Small case series have reported mpox virus DNA detection in bodily fluids after healing of skin lesions; this raises uncertainty about the persistence of mpox virus in bodily fluids such as semen, vaginal fluids, saliva and blood, and the risk of onward transmission. As this is an emergency guidance produced in a quickly evolving situation the precautionary principle is being applied for this public health intervention. As more information becomes available and our understanding related to transmission improves the guidance will be updated accordingly.

6 Skin

6.1 Skin anatomy

The skin is an active barrier between the external environment and internal organs. In mpox, it has a central role in transmission, treatment, prevention and control. In health, the skin protects against harmful insults and microorganisms. However, when the protection is compromised, the risk of infection increases significantly, both locally in the skin, and in the rest of the body.



Structurally, the skin is composed of three layers:

- epidermis (outermost layer)
- dermis
- subcutaneous tissue (deepest layer).

Mpox infection primarily affects the epidermis and, in some cases, the dermis. Complications such as cellulitis and abscesses can extend deeper. Infected skin cells undergo necrosis (cell death) and are gradually replaced by new cells over an average period of 2 to 4 weeks [\[43\]\[143\]](#). This timeline aligns with typical skin's natural regeneration cycle of 28 days.

6.2 Terminology in this guideline

- "Simple lesions": Typical mpox skin eruptions which progress through three phases: 1) pre-eruptive, before visible skin lesions appear; 2) eruptive, when lesions become visible; 3) convalescent, when the skin begins to heal. During the eruptive phase, lesions often begin as primary lesions, such as macules, papules, vesicles, blisters, pustules, pseudopustules or nodules [\[144\]\[145\]](#).
- "Complex lesions" evolve from simple lesions due to secondary changes such as bacterial super-infection, scratching, manipulation, or detrimental effects of topically applied substances. These complex lesions can present as ulcers, abscesses, cellulitis, or others which extend deeper into the skin.
- "Broken skin" has compromised integrity due to, for example, cuts, abrasions, or co-morbid or pre-existing skin conditions. As noted, this weakens the defensive barrier and increases the chance of infection.

Lesions that are open, oozing fluid or covered with crusts carry a high risk of spreading the virus through direct contact.

6.3 Skin care (non-complex lesions)

WHO suggests against routinely covering mpox skin lesions.

Conditional recommendation, very low certainty of evidence, February 2026.

- This recommendation applies only when the patient is isolated. In order to be compliant with [IPC recommendations](#), lesions should be covered to prevent transmission when not isolating.
- Patients should avoid scratching the skin.
- Keep skin lesions clean and dry to prevent bacterial infection.
- The WHO quick reference poster on [mpox related skin care](#) can be used to support management.

6.3.1 Oozing lesions

Lesions that are actively oozing require frequent cleaning, using clean water in community settings or normal saline in clinical settings. After cleaning, cover as needed based on the lesion's size, location and condition. Absorbent dressings may be used to manage exudate, with regular changes to maintain hygiene.

6.3.2 Healing and scab management

As lesions begin to heal and form scabs, it is important not to pick or peel them. Daily gentle cleaning is generally sufficient unless complications arise. If necrotic tissue (dead skin) is present, surgical debridement by a plastic surgeon may be required to promote healthy healing.

6.3.3 Preventing long-term skin damage

Healing skin should not be scratched or exposed to harmful substances, as this may result in poor cosmetic outcomes. Manipulated or poorly managed lesions often lead to:

Permanent scarring.

Hyperpigmentation (dark spots) or hypopigmentation (light spots).

Surface distortion or, in severe cases, contractures (tightening of the skin).

6.3.4 Rationale

This recommendation informed by expert consensus reflects the plausible lack of clinical benefit, potential harms (e.g., delayed healing, discomfort, secondary infection), and resource implications. Covering may be appropriate in specific situations which can be assessed on a case-to-case basis. It is recognised that recommendations for infection prevention and control may promote covering of skin in some circumstances (see [isolation recommendation](#)).

6.3.5 Evidence to decision considerations

6.3.5.1 Benefits and harms

Important harms

The GDG considered that routine covering of skin lesions offers no added benefit in most cases and may, in fact, pose harms. Occlusion may increase pain, maceration, secondary bacterial infection and delayed healing. Some experts noted that covering may be beneficial in limited circumstances (e.g. extensive oozing or high-contact scenarios), but these would be case-specific.

6.3.5.2 *Evidence*

Very low

This recommendation was informed by clinical experience, expert opinion and extrapolation from wound care in other viral dermatologic conditions. No comparative studies were identified to support routine covering. However, the absence of benefit and possible harms informed the recommendation.

6.3.5.3 *Values and preferences*

No substantial variability expected

The GDG judged that most patients and health care workers prefer minimal intervention when there is no added benefit, especially if dressing is painful or difficult to maintain.

6.3.5.4 *Resources and other considerations*

Important negative issues

Routine dressing of all lesions would require substantial consumables, nursing time, and may strain health systems during outbreaks. A selective, symptom-based approach to dressing is more resource-efficient and patient-centred, allowing for targeted use when clinically indicated.

6.3.5.5 *Equity*

No important issues with the recommended alternative

The GDG assessed that in settings with limited access to dressings, a routine covering recommendation could worsen inequities by raising expectations for resources that cannot be met. A more targeted approach ensures equity by reserving dressings for patients with the highest need.

6.3.5.6 *Acceptability*

No important issues with the recommended alternative

The recommendation is acceptable to most providers, as it aligns with simple, low-burden care practices.

6.3.5.7 *Feasibility*

No important issues with the recommended alternative

Implementation is feasible in both home-based care and facility settings.

WHO suggests the use of soap and clean, filtered water or normal saline rather than antiseptic agents for the routine cleaning of mpox skin lesions where the skin is intact.

Conditional recommendation, very low certainty of evidence, February 2026.

6.3.6 Rationale

The GDG recommended soap and clean, filtered water or normal saline over antiseptics for routine cleaning of intact mpox skin lesions keeping in view the balance of potential harms and benefits, values and preferences, and resource implications. Antiseptics may be irritating to intact skin, and evidence is lacking of additional benefit over gentle cleaning with soap and water [146]. This recommendation promotes safe, low-cost, and patient-acceptable practices, especially in community settings and low-resource environments.

6.3.7 Evidence to decision considerations

6.3.7.1 Benefits and harms

Substantial net benefits of the recommended alternative

The GDG assessed that gentle cleansing with soap and water or normal saline supports hygiene and may prevent secondary infection without harming intact skin. In contrast, routine use of antiseptic agents (e.g. chlorhexidine, povidone-iodine) on intact lesions may cause skin irritation, discomfort, delayed healing, and potential systemic absorption. There is no demonstrated additional benefit of antiseptics in this context, and possible harms make them less suitable for routine use.

6.3.7.2 Evidence

Very low

There are no direct comparative trials in mpox and this recommendation is informed by expert consensus. The GDG considered biological plausibility and practical experience.

6.3.7.3 Values and preferences

No substantial variability expected

Patients and caregivers generally prefer simple, low-cost and non-irritating methods for lesion care. Health care providers also value ease of implementation and safety in home and low-resource settings.

6.3.7.4 Resources and other considerations

No important issues with the recommended alternative

Soap and clean water or saline are more widely available, less expensive and easier to implement in most settings compared with antiseptic agents.

6.3.7.5 Equity

No important issues with the recommended alternative

The GDG assessed that this approach would improve equity by recommending materials that are almost universally accessible, including in low-resource and community settings.

6.3.7.6 *Acceptability*

No important issues with the recommended alternative

The recommendation is likely acceptable to most patients and caregivers, as it aligns with basic hygiene practices.

6.3.7.7 *Feasibility*

No important issues with the recommended alternative

Implementation is highly feasible in both home-based care and facility care settings, as the required resources are simple and already integrated into routine hygiene practices.

WHO suggests the use of soap and clean, filtered water or normal saline rather than antiseptic agents for the routine cleaning of mpox skin lesions where the skin is broken and there is no bacterial infection.

Conditional recommendation, very low certainty of evidence, February 2026.

- The use of antiseptic agents for routine cleaning might be considered depending on the site and type of lesion. Choice of cleaning agent will depend on a number of factors, and antiseptic agents might be considered for:
 - Genital and anal lesions.
 - Intertriginous areas.
 - Risk factors for infection as judged by the assessing health care provider.

6.3.8 Rationale

While no comparative trials exist evaluating different cleansing agents in mpox-related lesions, the GDG assessed that gentle cleansing with soap and water or saline is generally sufficient for maintaining lesion hygiene and preventing infection in uncomplicated, non-infected skin breaks. This approach is low-cost, widely available and safe, with minimal risk of local irritation or systemic harm. Indirect evidence was provided from pre-operative care and burns patients [146][147].

However, the group recognized clinical scenarios where the use of antiseptic agents might be appropriate, such as:

- Genital or anal lesions, where contamination risk is higher.
- Intertriginous areas, where moisture and friction predispose to secondary infection.
- Patients with elevated risk of bacterial infection, including those with poor hygiene, immunosuppression, or visible signs of evolving infection.
- The choice of cleaning agent should therefore be individualized, depending on lesion type, location, patient comorbidities and health care provider judgement.

6.3.9 Evidence to decision considerations

6.3.9.1 Benefits and harms

Substantial net benefits of the recommended alternative

Where there is no bacterial infection, cleaning broken skin lesions with soap and water or saline may help prevent secondary bacterial infection and support healing. Antiseptic agents in this context have the potential to cause pain and skin irritation with no proven additional benefit.

6.3.9.2 Evidence

Very low

There are no direct comparative trials in mpox and this recommendation is informed by expert consensus. The GDG considered biological plausibility and practical experience.

6.3.9.3 Values and preferences

No substantial variability expected

The panel judged that both patients and providers prefer safe, simple, and tolerable methods for wound care.

6.3.9.4 *Resources and other considerations*

No important issues with the recommended alternative

Soap and clean water or saline are accessible, low-cost and sustainable options in most settings, making this recommendation particularly relevant for home-based care and resource-limited environments.

6.3.9.5 *Equity*

No important issues with the recommended alternative

The GDG assessed that this approach would improve equity by recommending materials that are almost universally accessible, including in low-resource and community settings.

6.3.9.6 *Acceptability*

No important issues with the recommended alternative

The recommendation is likely acceptable to most patients and caregivers, as it aligns with basic hygiene practices.

6.3.9.7 *Feasibility*

No important issues with the recommended alternative

Implementation is highly feasible in both home-based care and facility care settings, as the required resources are simple and already integrated into routine hygiene practices.

WHO suggests against the routine use of topical antibiotics in patients with mpox and extensive skin lesions or exfoliation, and in the absence of clinical secondary bacterial infections.

Conditional recommendation, very low certainty of evidence, February 2026.

6.3.10 Rationale

The GDG issued a conditional recommendation against the routine use of topical antibiotics in patients with mpox and extensive skin lesions or exfoliation, in the absence of signs of secondary bacterial infection, based on a lack of direct supporting evidence, plausible potential for harm and considerations of antimicrobial stewardship.

There are no controlled studies evaluating the routine use of topical antibiotics in mpox-related skin lesions. Extrapolations from other dermatological conditions suggest that indiscriminate topical antibiotic use does not meaningfully prevent infection and may lead to adverse skin reactions, local irritation and contact dermatitis.

The GDG noted that good hygiene practices, such as cleansing with soap and clean water or saline, are likely sufficient for routine lesion care when the skin barrier is intact or non-infected, and may be safer, more sustainable and acceptable to patients. In settings where patients have poor hygiene, live in remote areas, or may have already self-medicated with unknown topical substances, clinical judgement remains essential.

6.3.11 Evidence to decision considerations

6.3.11.1 Benefits and harms

There is no direct evidence on the clinical benefit or harm of routine topical antibiotics in the absence of clear signs of secondary bacterial infection in patients with mpox. The GDG assessed that routine application may offer minimal marginal benefit in preventing infection, especially when good hygiene and appropriate lesion care are practised. However, harms such as local allergic reactions, contact dermatitis and promotion of antimicrobial resistance, particularly in the context of widespread and unsupervised use, are plausible and have been documented with similar skin conditions. Therefore, the balance of benefits and harms does not favour routine use in uncomplicated cases.

6.3.11.2 Evidence

Very low

6.3.11.3 Values and preferences

We expect few to want the intervention

The GDG assessed that when informed about the uncertain benefit and possible risks, many patients may prefer to avoid unnecessary medication.

6.3.11.4 Resources and other considerations

No important issues with the recommended alternative

Routine use would be costly and unsustainable, particularly over large surface areas.

6.3.11.5 *Equity*

No important issues with the recommended alternative

The GDG noted that the recommendation would promote practices feasible in low-resource and home-based care settings and would prevent inequity from recommending supplies many cannot access.

6.3.11.6 *Acceptability*

No important issues with the recommended alternative

The GDG assessed that the recommendation would be acceptable to most patients and care providers. Clear communication on the lack of benefit and potential harms could improve acceptability and trust in the guidance.

6.3.11.7 *Feasibility*

No important issues with the recommended alternative

No concerns for feasibility as the recommendation relies on hygiene measures already available and reduces workload from dressing/medication routines.

WHO suggests against the routine use of systemic antibiotics in patients with mpox and extensive skin lesions or exfoliation, and in the absence of clinical secondary bacterial infection.

Conditional recommendation, very low certainty of evidence, February 2026.

- Patients who are immunosuppressed, such as those with advanced HIV infection, may be at higher risk for bacterial superinfection, and clinicians may opt for antibiotics in such cases, even in the absence of clear signs of infection. This underscores the need for clinical judgement and flexibility in implementation of this recommendation.
- Practical steps should be enacted to improve outcomes in these patients:
- Ensure adequate hydration and nutrition, as patients with heavy rash burden may develop exfoliation (in severe cases similar to partial thickness burns), which can be significant leading to dehydration and protein loss. Estimate percentage skin affected and consider treatment like burns.
- Bedside or surgical debridement should be done as required, and skin grafting may be used in very severe cases.

6.3.12 Rationale

Prophylactic use of antibiotics can increase the risk of emergence and transmission of multidrug-resistant (MDR) bacteria and places individuals at risk of possible side-effects of antibiotics, such as *Clostridium difficile* associated diarrhoea. Infections with MDR bacteria are more difficult to treat, and associated with increased morbidity and mortality [148].

6.3.13 Evidence to decision considerations

6.3.13.1 Benefits and harms

There is no direct evidence on the clinical benefit or harm of routine systemic antibiotics in the absence of clear signs of secondary bacterial infection in patients with mpox. We are very uncertain about the balance of benefits and harms.

6.3.13.2 Evidence

Very low

The overall certainty of evidence was very low across all critical outcomes.

6.3.13.3 Values and preferences

We expect few to want the intervention

Overall, the GDG judged that most patients would prefer to avoid antibiotics if explained that benefits are uncertain and harms possible.

6.3.13.4 Resources and other considerations

Important negative issues

Routine systemic antibiotics are costly and not feasible in outbreaks or low-resource settings if used widely.

6.3.13.5 *Equity*

The GDG assessed that a conditional recommendation against routine use promotes equitable care, emphasizing hygiene, supportive care and targeted treatment when infection is confirmed.

6.3.13.6 *Acceptability*

No important issues with the recommended alternative

6.3.13.7 *Feasibility*

No important issues with the recommended alternative

Feasible across health systems as recommendation avoids strain on supply chains, reduces unnecessary prescribing and simplifies case management.

6.4 Complex lesions, abscess and bacterial skin infection

WHO suggests to use routine systemic antibiotics for patients with mpox who have undergone surgical drainage of skin abscess.

Conditional recommendation, low certainty evidence, February 2026.

- Patients with bacterial superinfection of mpox rashes may develop an abscess (the collection of pus within the dermis or subcutaneous tissue), most commonly due to skin bacteria including *Streptococcus* spp. and *Staphylococcus* spp. [149]. An abscess may appear as a painful, red, shiny nodule with or without fluctuance. This may be associated with surrounding cellulitis, worsening pain at the site of infection and fever. Treatment of an abscess is incision and drainage done by sterile aseptic technique by a qualified health worker using appropriate IPC measures. Depending on the location in the body (e.g. adjacent to major blood vessels), size and complexity of the abscess, the incision and drainage may need to be performed in the operating theatre. Where possible, abscess fluid should be aspirated and sent for microbiology and culture to guide antimicrobial therapy [149].

6.4.1 Rationale

This conditional recommendation is informed by a systematic review of randomized trials evaluating the effectiveness of systemic antibiotics following abscess drainage [150]. While the evidence is indirect (derived from non-mpox populations) the GDG judged it to be relevant and applicable to patients with mpox who present with skin abscesses.

The use of systemic antibiotics following surgical drainage may reduce recurrence, pain, hospitalization and the need for additional procedures, although the certainty of evidence for these outcomes is low. The impact on treatment failure is very uncertain (very low certainty). The risk of adverse events is probably increased, but considered acceptable given the potential benefits. The GDG also considered the potential contribution to AMR.

Given that abscesses in mpox may be more frequent or complicated in immunocompromised individuals, the GDG judged that most patients would value reduced recurrence and complications, even in the face of modest side-effects. On balance, the benefits of routine antibiotic use were judged to outweigh the harms in most cases, particularly where follow-up is uncertain or where access to re-intervention is limited.

6.4.2 Evidence to decision considerations

6.4.2.1 Benefits and harms

Small net benefit, or little difference between the alternatives

Systemic antibiotics may reduce recurrence, hospitalizations and pain within 3 days, and the need for additional surgical procedures following abscess drainage.

However, adverse events are probably increased and there is also potential contribution to antimicrobial resistance (AMR).

6.4.2.2 Evidence

The overall certainty across all critical outcomes was low.

6.4.2.3 Values and preferences

No substantial variability expected

The GDG judged that patients are likely to value reduced recurrence, pain and hospital visits, even if it comes with a small risk of side-effects.

6.4.2.4 Resources and other considerations

No important issues with the recommended alternative

Systemic antibiotics are generally available. To ensure appropriate use, the choice of regimen should be guided by local antimicrobial resistance patterns.

6.4.2.5 Equity

No important issues with the recommended alternative

The GDG noted that in populations with limited access to repeat care or surgical facilities, the benefit of reducing recurrence is greater, so this prevents inequities linked to repeated procedures.

6.4.2.6 Feasibility

No important issues with the recommended alternative

Implementation is feasible in most settings. However, concerns about overuse and resistance were noted, especially if antibiotics are prescribed broadly without clinical judgement. The GDG emphasized routine does not mean universal and clinical discretion remains key. Consideration should be given to local resistance patterns, as benefits are likely driven by methicillin-resistant *Staphylococcus aureus* (MRSA) active antibiotics. Appropriate antibiotic stewardship and patient follow-up are important to monitor for adverse events and prevent misuse.

In patients with mpox and mild uncomplicated bacterial skin infection, treat with amoxicillin and clavulanic acid, or cefalexin, or cloxacillin administered orally.

From: The WHO AWaRe (Access, Watch, Reserve) antibiotic book (2022) [149], revalidated February 2026.

- Intravenous administration is appropriate if the oral route is not possible due to the patient's clinical condition.
- Contextual factors, including local antibiograms, national AMR stewardship policies and patient risk profiles are highly important.
- Skin lesions in mpox may demonstrate mild erythema (redness) and/or skin hyperpigmentation due to inflammation in the absence of infection. This does not need to be treated with antimicrobial therapy. The decision to initiate antimicrobial therapy should be based on individual clinical assessment and local antimicrobial resistance patterns, and dosing recommendations in Table 6-1 [149]. If the patient does not improve clinically or the infection continues to spread, reassess the patient and reconsider the antibiotic regimen.

Table 6-1. Antibiotic dosing recommendations

	Amoxycillin-clavulanic acid	Cefalexin	Cloxacillin
ADULTS	500–125 mg orally every 8 hours	500 mg orally every 8 hours	500 mg orally every 8 hours
CHILDREN			
Weight	0–50 mg/kg of amoxicillin component every 12 hours OR 30 mg/kg every 8 hours orally	25 mg/kg every 12 hours orally	Neonates: 25–50 mg/kg twice daily; Children: 25 mg/kg every 6 hours
3 < 6 kg	250 mg of amoxicillin twice daily	125 mg every 12 hours	125 mg every 6 hours
6 < 10 kg	375 mg of amoxicillin twice daily	250 mg every 12 hours	250 mg every 6 hours
10 < 15 kg	500 mg of amoxicillin twice daily	375 mg every 12 hours	250 mg every 6 hours
15 < 20 kg	750 mg of amoxicillin twice daily	500 mg every 12 hours	500 mg every 6 hours
20 < 30 kg	1000 mg of amoxicillin twice daily	625 mg every 12 hours	750 mg every 6 hours
> 30 kg	Use adult dose	Use adult dose	Use adult dose

In the case of penicillin or beta-lactam allergy, use clindamycin or trimethoprim-sulfamethoxazole. Adults: If concern for community acquired MRSA consider one of: clindamycin (600 mg orally every 8 hours); trimethoprim-sulfamethoxazole (800–160 mg orally every 12 hours); doxycycline (100 mg orally every 12 hours). Children: If concern for community-acquired MRSA consider clindamycin: neonates 5 mg/kg/dose every 8 hours; children 10 mg/kg/dose every 8 hours.

6.4.3 Rationale

This conditional recommendation, adopted from the WHO AWaRe (Access, Watch, Reserve) antibiotic guidance, supports the use of oral co-amoxiclav, cefalexin or cloxacillin for the treatment

of mild uncomplicated skin infections [149]. These antibiotics are categorized as “Access” antibiotics within the WHO Essential Medicines List and are considered effective, safe and appropriate for first-line use in non-severe infections [151].

The GDG considered this recommendation applicable to mpox-related secondary skin infections that are localized and not associated with systemic signs of infection. The selected antibiotics offer good coverage for common skin pathogens (such as *Staphylococcus aureus* and *Streptococcus pyogenes*) and have favourable safety profiles. The use of oral therapy supports outpatient care and avoids unnecessary escalation to broader-spectrum or injectable antibiotics.

Although the recommendation is supported by long-standing clinical experience and global guidance, the GDG emphasized the importance of contextual factors, including local antibiograms, national AMR stewardship policies, and patient risk profiles. For patients with signs of systemic illness or sepsis, or in regions with high resistance to first-line agents, alternative or broader-spectrum antibiotics may be required.

The recommendation promotes antimicrobial stewardship by reinforcing the use of narrow-spectrum agents when appropriate, while maintaining flexibility to adapt based on national guidelines and clinical judgement.

6.4.4 Evidence to decision considerations

6.4.4.1 *Benefits and harms*

Substantial net benefits of the recommended alternative

Oral co-amoxiclav, cefalexin and cloxacillin are well-established, first-line options for mild uncomplicated skin infections and are effective against the most common causative pathogens [149]. Overall, the benefits of appropriately targeted treatment were judged by the GDG to outweigh the adverse effects with these drugs in patients with mild uncomplicated infections.

6.4.4.2 *Evidence*

This recommendation was adopted from a non-GRADE based WHO guideline [149].

6.4.4.3 *Values and preferences*

No substantial variability expected

The GDG inferred that patients value treatment that avoids complications or progression. Providers would value the potential benefit of interventions over the potential adverse events. GDG also noted this aligns with AMR stewardship and national guidelines. Preference may vary in settings with high resistance.

6.4.4.4 *Resources and other considerations*

No important issues with the recommended alternative

The recommended antibiotics are inexpensive, widely available and listed in the WHO Essential Medicines List.

6.4.4.5 *Equity*

No important issues with the recommended alternative

Adopting simple, affordable oral antibiotics for uncomplicated skin infections promotes equity, as these medicines are generally accessible even in low-resource settings.

6.4.4.6 *Acceptability*

No important issues with the recommended alternative

The intervention is expected to be highly acceptable to both providers and patients. It aligns with established WHO recommendations, existing clinical practice and patient expectations for effective treatment of skin infections. The use of oral formulations further enhances acceptability.

6.4.4.7 *Feasibility*

No important issues with the recommended alternative

Oral antibiotics can be administered in outpatient or community settings with minimal infrastructure. Clinical guidelines, job aids and training already incorporate these agents, making uptake feasible across health systems.

In patients with mpox and bacterial skin infection which is severe (rapidly spreading, associated with marked swelling or with signs of systemic involvement or sepsis), treat with intravenous antibiotics.

From: *The WHO AWaRe (Access, Watch, Reserve) antibiotic book (2022)* [149], revalidated February 2026.

- The GDG emphasized the importance of contextual factors, including local antibiograms, national antimicrobial resistance stewardship policies and patient risk profiles.
- De-escalation to oral therapy is recommended once clinical improvement is observed.
- Treatment should be guided by national antibiotic protocols, and regimens are therefore not listed here. Secondary bacterial infection of mpox skin lesions should be monitored closely. A swab of a superficial skin infection is unlikely to be helpful unless the patient has had a prolonged hospitalization and there is concern for an organism with multidrug resistance (MDR). Signs of bacterial infection include erythema, induration, warmth, worsening pain, a purulent drainage, malodorous discharge or recurrence of fever. In selected cases based on individual risk factors, known colonization and local prevalence, consider the possibility of community-acquired methicillin-resistant *Staphylococcus aureus* (MRSA).

6.4.5 Rationale

This conditional recommendation is adopted from the WHO AWaRe antibiotic guidance and reflects the standard approach to managing severe uncomplicated skin infections, such as cellulitis or erysipelas with systemic symptoms, where oral therapy may be insufficient. In patients with mpox, extensive skin involvement or secondary bacterial infection can progress rapidly, especially in high-risk groups (e.g. immunocompromised individuals, young children, or those with poor access to follow-up care) [149].

The GDG judged that intravenous antibiotics are appropriate for patients presenting with severe local symptoms (e.g. rapid spread, marked swelling or erythema), signs of systemic involvement (e.g. fever, tachycardia), or those who are unable to tolerate oral medication. Although direct evidence in mpox is lacking, this recommendation is supported by long-standing clinical practice and global guidance for similar bacterial skin and soft tissue infections.

The GDG emphasized that treatment should be guided by national antibiotic protocols and antibiograms, and that early de-escalation to oral therapy is encouraged once clinical improvement is observed.

This recommendation balances the need for effective treatment of potentially serious infections with the principles of antimicrobial stewardship and appropriate resource use.

6.4.6 Evidence to decision considerations

6.4.6.1 Benefits and harms

Substantial net benefits of the recommended alternative

The GDG judged that intravenous antibiotics provide important benefits over oral antibiotics for patients with mpox and severe uncomplicated skin infection.

6.4.6.2 Evidence

This recommendation was adopted from a non-GRADE based WHO guideline [149].

6.4.6.3 Values and preferences

No substantial variability expected

The GDG judged that most patients and providers would value effective and rapid treatment to reduce symptoms and avoid complications. There may be concerns about discomfort or hospital-based treatment, but these are likely outweighed by perceived benefit in more severe presentations.

6.4.6.4 Resources and other considerations

No important issues with the recommended alternative

Intravenous therapy requires hospital admission or close clinical supervision of ambulatory therapy, which may not be feasible in all settings. However, in severe cases, this level of care is often already indicated. Drug costs and delivery systems vary, but intravenous antibiotics are generally available and affordable. Stewardship considerations remain important, with early transition to oral therapy recommended when clinically appropriate.

6.4.6.5 Equity

No important issues with the recommended alternative

Providing intravenous antibiotics in severe cases promotes equity by ensuring patients at highest risk receive life-saving treatment. However, inequities may persist where inpatient care or intravenous formulations are not accessible. Strengthening referral systems and supply chains is critical to avoid gaps in care between well-resourced and remote settings.

6.4.6.6 Acceptability

No important issues with the recommended alternative

The intervention is highly acceptable to clinicians, as it aligns with established global practice in treating severe skin infections. Patients are also likely to view hospital-based intravenous therapy as an appropriate response to severe illness, especially when it leads to clear clinical improvement and transition to oral treatment as recovery occurs.

6.4.6.7 Feasibility

No important issues with the recommended alternative

Implementation is feasible in secondary and tertiary facilities where intravenous capacity and antibiotics are available.

In patients with mpox, treat pyomyositis with amoxicillin and clavulanic acid, or cefalexin, or cloxacillin.

From: *The WHO AWaRe (Access, Watch, Reserve) antibiotic book (2022)* [149], revalidated February 2026.

- Alternative regimens may be chosen according to the clinical assessment.
- The choice of oral or intravenous administration of antibiotics relies on careful clinical assessment of disease severity and other patient factors.

6.4.7 Rationale

This recommendation is adapted from the WHO AWaRe antibiotic guidance, which includes amoxicillin and clavulanic acid, cefalexin, and cloxacillin as appropriate treatments for early stage pyomyositis. In patients with mpox, skin and soft tissue infections, including deep infections such as pyomyositis, may occur due to extensive skin breakdown, immunosuppression or delayed care [149].

Although no studies have evaluated antibiotic treatment of pyomyositis specifically in the context of mpox, the GDG assessed that these antibiotics provide effective coverage against typical pathogens, including *Staphylococcus aureus*, with a favourable safety and access profile. Use of these agents is consistent with WHO's Access antibiotic category, promoting antimicrobial stewardship and equity.

6.4.8 Evidence to decision considerations

6.4.8.1 Benefits and harms

Substantial net benefits of the recommended alternative

The GDG judged that antibiotics such as amoxicillin and clavulanic acid, cefalexin, and cloxacillin are effective first-line therapies for pyomyositis, targeting the most common pathogens (*Staphylococcus aureus* and *Streptococcus* species). Their use is expected to reduce morbidity and prevent progression to systemic infection or sepsis. The potential harms are those associated with any systemic antibiotic therapy, including allergic reactions, gastrointestinal adverse effects, and, at a population level, contribution to antimicrobial resistance.

6.4.8.2 Evidence

The recommendation was adopted from a non-GRADE based WHO guideline [149].

6.4.8.3 Values and preferences

No substantial variability expected

The GDG judged that patients would place high value on preventing the progression to abscess or systemic illness and avoiding hospitalization or surgical drainage.

6.4.8.4 Resources and other considerations

No important issues with the recommended alternative

These antibiotics are generally available, low cost and included in most national essential medicines lists. Their classification as WHO "Access" antibiotics supports rational use and alignment with AMR stewardship goals. Local antibiograms should guide final drug selection.

6.4.8.5 *Equity*

No important issues with the recommended alternative

The use of affordable, first-line oral and parenteral antibiotics promotes equity by ensuring that effective treatment is accessible in low-resource settings.

6.4.8.6 *Acceptability*

No important issues with the recommended alternative

This recommendation is acceptable to both providers and patients, as it reflects established clinical practice and aligns with WHO AWaRe guidelines [149].

6.4.8.7 *Feasibility*

No important issues with the recommended alternative

The recommendation is highly feasible to implement across most health care systems. It requires no specialized infrastructure beyond diagnostic capacity to identify pyomyositis and access to basic antibiotics.

In patients with mpox, treat necrotising soft tissue infection immediately by surgical debridement followed by antibiotics.

From: *The WHO AWaRe (Access, Watch, Reserve) antibiotic book (2022)* [149], revalidated February 2026.

- Consider resistance patterns.
- Necrotizing soft tissue infection is life-threatening, affecting the deep soft tissue and muscle fascia and causing necrosis, tissue destruction and systemic effects in the cardiovascular system and other organs. Suggestive features include oedema, crepitus, malodorous discharge or pain out of proportion to appearance of infection. Though can be caused by MPVX, consider bacterial pathogens as well. Suggested antibiotics are piperacillin-tazobactam (adults: 4.5 g every 8 hours) plus clindamycin (adults: 150–300mg every 6 hours, children: 3–6 mg/kg 4 times a day [max. 450 mg]), or a carbapenem plus clindamycin.

6.4.9 Rationale

Immediate surgical debridement is critical for removing necrotic tissue and limiting the rapid spread of infection. It is the primary life-saving intervention, while antibiotics serve as a complementary measure. Delays in surgery are consistently associated with increased mortality. Empiric antibiotic regimens (e.g. piperacillin-tazobactam plus clindamycin) offer broad-spectrum coverage and toxin suppression, improving survival [149]. Harms may include operative complications or antibiotic side-effects, but these are outweighed by the potential to prevent death or loss of limb. The recommended empiric antibiotic regimen (piperacillin-tazobactam plus clindamycin) offers broad-spectrum coverage. Adjustments may be needed based on pathogen identification, MRSA suspicion or local antimicrobial resistance patterns (e.g. addition of vancomycin or substitution with ceftriaxone plus metronidazole if *Streptococcus pyogenes* is excluded).

6.4.10 Evidence to decision considerations

6.4.10.1 Benefits and harms

Substantial net benefits of the recommended alternative

The GDG agreed that the primary benefit of this recommendation is rapid, life-saving treatment. Necrotizing soft tissue infection is a surgical emergency with high mortality if debridement is delayed. The harms would include surgical complications, the need for anaesthesia and intensive post-operative care, and the risks associated with broad-spectrum antibiotic use such as allergic reactions, gastrointestinal side-effects and antimicrobial resistance. Nevertheless, the benefits of immediate intervention clearly outweigh these risks.

6.4.10.2 Evidence

This recommendation was adopted from a non-GRADE based WHO guideline [149].

6.4.10.3 Values and preferences

No substantial variability expected

The GDG judged that patients and providers highly value interventions that prevent rapid deterioration and death. Early aggressive intervention is the global standard of care in necrotizing soft tissue infection and withholding surgery is rarely acceptable. Preferences may vary slightly regarding antibiotic combinations, but not the need for debridement.

6.4.10.4 Resources and other considerations

No important issues with the recommended alternative

Successful implementation would require skilled surgeons, operating theatres and post-operative care. Access to broad-spectrum antibiotics, such as piperacillin-tazobactam with clindamycin, or ceftriaxone with metronidazole, with vancomycin added if MRSA is suspected, are also needed. Delays in either surgical or antibiotic treatment are associated with substantially worse outcomes, reinforcing the need for adequate systems and rapid referral pathways.

6.4.10.5 Equity

No important issues with the recommended alternative

Without clear referral mechanisms, patients in remote or resource-poor settings may face catastrophic delays. The GDG highlighted the need for strengthening referral systems to reduce these inequities.

6.4.10.6 Acceptability

No important issues with the recommended alternative

This intervention would be acceptable to clinicians, as it aligns with standard global practice in managing necrotizing soft tissue infection. Patients and families are also likely to accept it in view of the high mortality risk if surgery is delayed or antibiotics withheld.

6.4.10.7 Feasibility

Important issues, or potential issues not investigated

In tertiary hospitals with surgical teams and intensive care units, the recommendation is readily implementable. In primary or peripheral facilities, however, the lack of surgical and antibiotic capacity may render immediate implementation difficult, necessitating rapid transfer protocols.

7 Complications and concomitant conditions



7.1 Rate of complications

Table 7-1 shows the rate of complications reported in mpox patients. Overall, complications were uncommon (< 10%) but significant variation was observed between the non-severe and severe cohort of patients. In the severe cohort, complications commonly reported (>10%) included: secondary bacterial infection (21%), gastroenteritis (13%), severe pain (27%), cellulitis (15%), proctitis (24%), urethritis (17%) and rectal bleeding (16%). These data are from the systematic review that included studies published up to September 2024 [41] which comprise data predominantly from clade 2b disease (see Annex 7 for details).

Table 7-1. Baseline risk for complications of mpox

Outcomes	Event rate (95% CI per 1000)		
	Non-severe cohort*	Severe cohort*	Overall
Secondary infection	75 per 1000 (69 to 84)	210 per 1000 (188 to 232)	92 per 1000 (86 to 99)
Rectal bleeding	26 per 1000 (8 to 51)	160 per 1000 (111 to 215)	74 per 1000 (50 to 101)
Proctitis	67 per 1000 (62 to 72)	235 per 1000 (177 to 298)	69 per 1000 (64 to 74)
Pharyngitis	56 per 1000 (33 to 84)	71 per 1000 (21 to 146)	58 per 1000 (37 to 84)
Severe pain	24 per 1000 (19 to 29)	273 per 1000 (243 to 303)	51 per 1000 (45 to 58)
Cellulitis	42 per 1000 (35 to 51)	153 per 1000 (102 to 211)	46 per 1000 (38 to 55)
Penile oedema	45 per 1000 (35 to 56)	NA	45 per 1000 (35 to 56)
Keratitis	63 per 1000 (30 to 106)	32 per 1000 (16 to 52)	39 per 1000 (24 to 58)
Respiratory failure	NA	37 per 1000 (21 to 56)	37 per 1000 (21 to 56)
Conjunctivitis	38 per 1000 (33 to 43)	20 per 1000 (13 to 30)	34 per 1000 (30 to 39)
Tonsillitis	30 per 1000 (23 to 37)	70 per 1000 (40 to 107)	32 per 1000 (26 to 39)
Abscess	27 per 1000 (18 to 38)	17 per 1000 (7 to 31)	24 per 1000 (16 to 32)
Gastroenteritis	12 per 1000 (0.2 to 35)	125 per 1000 (37 to 248)	23 per 1000 (6 to 48)
Acute kidney injury	NA	14 per 1000 (2 to 34)	14 per 1000 (2 to 34)
Urethritis	11 per 1000 (8 to 14)	167 per 1000 (88 to 263)	12 per 1000 (8 to 15)
Paraphimosis	9 per 1000 (6 to 12)	NA	9 per 1000 (6 to 12)
Urinary retention	7 per 1000 (0.2 to 19)	18 per 1000 (0 to 75)	7 per 1000 (0.5 to 19)
Pneumonia	3 per 1000 (1 to 6)	32 per 1000 (8 to 67)	4 per 1000 (1 to 7)
Sepsis	0.3 per 1000 (0 to 1.5)	38 per 1000 (23 to 55)	2 per 1000 (0.3 to 3)
Epiglottitis	1 per 1000 (0 to 7)	NA	1 per 1000 (0 to 7)
Encephalitis	0 per 1000 (0 to 0.2)	3 per 1000 (0 to 9)	0 per 1000 (0 to 0.2)
Myocarditis	0 per 1000 (0 to 0.01)	NA	0 per 1000 (0 to 0.01)

* The review team used a 50% threshold to categorize studies as severe or non-severe. Studies with fewer than 50% of participants classified as having severe mpox or hospitalized for treatment were categorized as non-severe; studies with 50% or more were categorized as severe.

7.2 Mpox-associated eye disease

Mpox associated eye disease is defined here in the context of a diagnosis of mpox as: eye pain and/or redness which is consistent with conjunctivitis and/or keratitis and/or other ocular pathology. The most significant sequelae are corneal scarring and loss of vision [49][154][155].

Keratitis, defined as inflammation of the cornea, may involve epithelial keratitis with loss of the superficial barrier function of the cornea and conjunctivitis, or inflammation of the conjunctival tissues overlying the sclera. Stromal keratitis has also been reported in association with mpox. Both keratitis and conjunctivitis have been associated with monkeypox virus (MPXV) DNA detection within the tear film, which has implications for therapy. Specifically, a range of antiviral therapies have been proposed including topical (e.g., trifluridine, ganciclovir gel), and systemic antiviral therapies (e.g., tecovirimat, cidofovir). The potential for MPXV DNA persistence also has implications for anti-inflammatory therapy, as corticosteroid use has been associated with prolongation of viral infection and/or worsening disease in the absence of antiviral therapy (e.g., herpetic keratitis).

Other severe complications of mpox-associated eye disease include corneal perforation, corneal staphyloma, and hypopyon uveitis. Mpox-associated eye disease has been observed in association with both clade I and clade II mpox but early detection and management are essential to avoid vision-threatening sequelae associated with undetected or untreated disease.

A WHO [quick reference poster on mpox eye disease](#) is available to support clinical management [156].

WHO suggests against the use of topical corticosteroids for patients with mpox-related eye pain and/or redness.

Conditional recommendation, very low certainty of evidence, February 2026.

- Good routine eye care includes eye lubrication and saline-soaked protective eye pads [156]. While the role of vitamin A supplementation is unknown for mpox-related eye disease, vitamin A supplementation according to national / Ministry of Health guidance can be given, especially in areas with high rates of malnutrition [157].

7.2.1 Rationale

This conditional recommendation against the use of topical corticosteroids is based on the absence of evidence supporting benefit and the potential for harm in patients with viral eye disease. While corticosteroids are commonly used in ophthalmology to manage inflammatory conditions, their use in the setting of active viral infection, such as mpox-related conjunctivitis or keratitis, can suppress local immune responses, delay healing and exacerbate viral replication or secondary infection. Indirect evidence was provided from epidemic keratoconjunctivitis [158][159].

7.2.2 Evidence to decision considerations

7.2.2.1 Benefits and harms

Direct evidence on the benefits and harms of steroids in mpox-associated ocular disease is lacking. Indirect evidence is inconclusive with regard to the benefits of steroids in mpox-associated eye disease. Indirect evidence of harms from steroid treatment were not quantified but are well documented.

7.2.2.2 Evidence

The certainty of the evidence is very low, rated down for indirectness, risk of bias and imprecision.

7.2.2.3 Values and preferences

Substantial variability is expected or uncertain

The panel assessed that most mpox patients with ocular symptoms would wish to use a medication where there was potential for benefit unless there were important side-effects or risks. Keeping in view the potential for harms with the use of steroids in eye disease, patients would prioritise avoiding these in the absence of proven benefit of steroids.

7.2.2.4 Resources and other considerations

Steroids are often available and inexpensive, which increases the risk of inappropriate use. Clear guidance helps prevent harm, particularly in resource-limited settings.

7.2.2.5 Acceptability

No important issues with the recommended alternative

The recommendation is acceptable to most ophthalmologists and infectious disease specialists, who are aware of the risks of corticosteroids in viral eye disease.

7.2.2.6 Feasibility

No important issues with the recommended alternative

The recommendation is feasible to implement, as it primarily requires clinicians to withhold an intervention rather than provide one.

WHO suggests topical trifluridine for patients with mpox-related eye pain and/or redness [consistent with conjunctivitis and/or keratitis and/or other ocular pathology], preferably in the context of a clinical efficacy study.

Conditional recommendation, very low certainty of evidence, February 2026.

7.2.3 Rationale

This conditional recommendation in favour of topical trifluridine in clinical efficacy studies is based on its known antiviral activity against DNA viruses and its accepted use in the management of other viral eye diseases, such as herpes virus related eye disease [160]. In the absence of controlled trials for mpox, the GDG considered safety data from other uses and anticipated patient values and preferences, in addition to supporting data from case series and ophthalmic cell models [155][161].

Although the certainty of evidence is very low, the GDG anticipated patients would place a high value on preserving vision. The recommendation is conditional due to very low certainty evidence, limited access in many settings and cost considerations. The GDG strongly encouraged use within clinical study protocols or monitored use programmes where feasible [162].

7.2.4 Evidence to decision considerations

7.2.4.1 Benefits and harms

Direct evidence of the effectiveness of trifluridine in mpox-associated eye disease is lacking. One case series reported recovery in three out of four patients of ocular mpox given trifluridine and tecovirimat [155]. Some evidence of effectiveness is reported in ophthalmic cell models [161]. Indirect evidence from epidemic keratoconjunctivitis is inconclusive with regard to the benefits of trifluridine. The panel noted that experience of use in herpes keratitis and vaccinia suggests no significant harms.

7.2.4.2 Evidence

Very low

Very low certainty evidence rated down for risk of bias, imprecision and indirectness.

7.2.4.3 Values and preferences

No substantial variability expected

Patients would place high value on preventing vision loss. They would be likely to accept treatment even if benefits were uncertain provided there was minimal potential for harm.

7.2.4.4 Resources and other considerations

Important issues, or potential issues not investigated

Limited availability in many settings. Costs may be prohibitive for certain strata of the population.

7.2.4.5 Equity

Important issues, or potential issues not investigated

Cost and access constraints may limit equitable implementation of clinical trials. However, given the uncertainty of benefit, use of trifluoridine without formal evaluation in trials would drive inequity and may result in diversion of resources from the provision of core services and proven treatments.

7.2.4.6 *Acceptability*

No important issues with the recommended alternative

The intervention would likely be acceptable to clinicians experienced in eye care. Enrolment in clinical trials would likely be acceptable to patients and clinicians given current equipoise.

7.2.4.7 *Feasibility*

No important issues with the recommended alternative

Feasible in settings with ophthalmology support and access to trifluridine. Implementation in primary care or field settings may require referral pathways. For clinical evaluation of effect, randomised controlled trials have been shown to be feasible in highly resource restricted environments, but would be necessarily geographically limited.

7.3 HIV

WHO strongly recommends rapid ART initiation (≤ 7 days of HIV diagnosis) for adults, adolescents and children, including the offer of same-day start. This guidance is based on high-certainty evidence for adults and adolescents, low-certainty evidence for children (WHO Consolidated guidelines on HIV prevention, testing, treatment, service delivery and monitoring (2021) [142]).

The recommendation of rapid ART initiation acknowledges concerns of paradoxical immune reconstitution inflammatory system (IRIS) in the context of immunosuppression. Restoration of the immune function through ART is considered an important intervention in the management of opportunistic infections, especially if effective treatment is unavailable. However, for infections with central nervous system involvement such as TB and cryptococcal meningitis, and in the case of TB, targeted antimicrobial treatment and delay of ART with a few weeks is recommended to reduce the likelihood of paradoxical IRIS with adverse outcomes.

People with symptoms of mpox should access health services and HIV testing early to reduce the risk of severe mpox disease.

WHO recommends rapid initiation of antiviral therapy (ART) in people with mpox and HIV who are ART naïve or have had a prolonged interruption of ART.

Strong recommendation, moderate certainty of evidence, May 2025.

- Early HIV testing should be conducted when patients present with suspected or confirmed mpox infection.
- The patient should be referred to appropriate services for ART initiation as soon as possible, aiming to provide therapy within 7 days of HIV diagnosis including the offer of same-day start.
- In people who are already on ART and with undetectable viral load, ART regimen should be continued without interruption or change. The viral load test result should be less than 1 year old; if not, a new viral load test should be conducted.
- The latest guidance from WHO on HIV prevention, testing, treatment, service delivery and monitoring can be found here: <https://iris.who.int/handle/10665/342899> [142].
Disseminated cryptococcosis skin lesions may resemble mpox under some circumstances. Guidelines for diagnosing, preventing and managing cryptococcal disease among adults, adolescents and children living with HIV from WHO can be found here: <https://iris.who.int/handle/10665/360423> [45].

7.3.1 Rationale

Review of technical guidance was provided by the [HIV technical working group](#).

Currently, in contrast to other opportunistic infections in which delayed ART is recommended, direct evidence regarding the timing of ART for mpox is only very low certainty. There is low-certainty evidence from comparison of uncontrolled versus controlled HIV in mpox that delayed ART may increase hospitalizations in mpox patients (5 non-randomized studies, 2037 participants, OR = 4.19, 95% CI 2.11–8.34).

Mpox IRIS following ART initiation may occur, but the frequency is uncertain. Differentiating between mpox IRIS and progressive mpox is complicated given the lack of clear case definition and overlapping manifestations.

In a technical meeting organized by WHO, expert consensus was that the general mortality reduction benefits of rapid ART initiation extend to patients with mpox. This included three randomized clinical trials which showed strong mortality benefits of rapid ART compared with delayed ART (RR 0.47, 95% CI 0.24–0.93) as well as positive impact on the frequency of ART initiation, retention in care and suppression of viral loads at 12 months

The panel accepted the risk of paradoxical IRIS, and noted that delaying ART initiation may possibly be harmful [86]. These conclusions were based on the lack of available evidence-based effective therapy for mpox, the continued mpox viral replication and disease progression in patients with immunosuppression, the estimation that mpox central nervous system manifestations are uncommon, and the concurrence of other opportunistic infections with mpox that would benefit from rapid ART initiation.

There is very low-certainty evidence regarding the impact of early treatment versus delay on occurrence and effects of IRIS in mpox/HIV co-infected patients.

The GDG considered that the evidence from people who did not have mpox would pertain to those who did (with this high-quality evidence being rated down for indirectness, and therefore an overall moderate certainty evidence for benefits in mpox).

On values and preferences, the panel judged that all or almost all HIV patients with mpox would place a higher value on the likely mortality benefit of initiating ART as soon as possible than on the possible increased risk of developing IRIS.

The panel acknowledged that a strong recommendation would reduce the likelihood of accrual of direct evidence pertaining to the PICO. However, observational data from clinical case series would allow estimation of the incidence of IRIS.

7.3.2 Evidence to decision considerations

7.3.2.1 *Benefits and harms*

Substantial net benefits of the recommended alternative

There is high-quality indirect evidence of the mortality benefits of initiating antiretroviral therapy (ART) as soon as possible. In the absence of any effective mpox-specific treatment to lower the viral load, the panel judged there to be little benefit in delaying ART initiation.

The panel judged there to be harms from delay of ART initiation. Immune recovery is central to viral control and recovery from disease, and treatment delay will likely delay immune recovery. The panel judged harms from delay very likely, including reduced linkage and retention in care, and progression of mpox viral replication.

Despite the absence of direct evidence from patients with mpox, the harms of uncontrolled, progressive mpox infection in the context of advanced immunosuppression is very well documented and can be fatal. The panel judged that these harms likely outweigh any potential harm arising from IRIS.

7.3.2.2 *Evidence*

Moderate

Current WHO recommendation for rapid ART initiation is based on high-quality evidence from three randomized controlled trials, with 7418 patients, which inferred mortality benefits [163]. The study populations within these trials did not include mpox patients, therefore, due to indirectness, the certainty in mortality benefit was assessed to be moderate.

IRIS can be severe when it occurs due to other opportunistic infections, but occurrence rates are uncertain in mpox.

7.3.2.3 *Values and preferences*

No substantial variability expected

The GDG inferred that most HIV patients with mpox would place a higher value on the mortality benefit of initiating ART as soon as possible than on the possible increased risk of developing IRIS.

7.3.2.4 Resources and other considerations

No important issues with the recommended alternative

No issues in a system which already provides antiretrovirals.

7.3.2.5 Equity

No important issues with the recommended alternative

No issues in a system which already provides antiretrovirals.

7.3.2.6 Acceptability

No important issues with the recommended alternative

No issues in a system which already provides antiretrovirals.

7.3.2.7 Feasibility

No important issues with the recommended alternative

No issues in a system which already provides antiretrovirals

In patients with mpox, treat suspected sepsis with broad spectrum antibiotics.

From: *The WHO AWaRe (Access, Watch, Reserve) antibiotic book (2022)* [149], revalidated February 2026.

- Local protocols for treatment should be followed which take account of aetiological frequency and resistance patterns.

7.3.3 Rationale

Although no studies specifically address sepsis in the context of mpox, the clinical presentation and pathophysiology are expected to be similar to sepsis of other causes. The GDG judged that early administration of broad-spectrum antibiotics as directed by local protocols would significantly improve outcomes in mpox patients with suspected sepsis.

In patients with mpox, the risk of secondary bacterial infection, particularly in those with extensive skin involvement, immunosuppression, or delayed care, warrants a high level of clinical vigilance. Sepsis in such patients may progress rapidly, and delays in initiating antibiotics are associated with increased mortality. Therefore, empiric treatment with broad-spectrum antibiotics is justified when sepsis is suspected [149]. Consider local patterns of aetiology and resistance, and the possibility of opportunistic infections in the case of immunosuppression and HIV. Where further diagnostic information is available, treatment should be personalized according to the results.

7.3.4 Evidence to decision considerations

7.3.4.1 Benefits and harms

Substantial net benefits of the recommended alternative

Prompt initiation of empiric broad-spectrum antibiotics in patients with suspected sepsis is a well-established life-saving intervention. In mpox patients, particularly those with immune compromise or severe disease progression, sepsis can develop due to secondary bacterial infection. Early antibiotic therapy could reduce mortality and organ dysfunction.

Risks include antibiotic-associated adverse effects, and contribution to antimicrobial resistance (AMR) if used indiscriminately or continued without reassessment and appropriate de-escalation.

7.3.4.2 Evidence

This recommendation was adopted from a non-GRADE based WHO guideline [149].

7.3.4.3 Values and preferences

No substantial variability expected

The GDG assessed that patients and clinicians are likely to strongly value rapid, life-saving interventions. In suspected sepsis, the risks of withholding antibiotics are generally considered greater than the risks of early empiric treatment. Values placed on survival, rapid stabilization and recovery are consistent across populations.

7.3.4.4 Resources and other considerations

No important issues with the recommended alternative

Broad-spectrum agents are included in WHO AWaRe guidance and are usually available in most settings.

7.3.4.5 *Equity*

Important issues, or potential issues not investigated

Strengthening procurement, supply and referral pathways is essential to avoid inequitable outcomes.

7.3.4.6 *Acceptability*

No important issues with the recommended alternative

Meropenem may be preferred where ESBL-producing organisms are prevalent. Final choice should be informed by national antibiotic guidelines and local resistance patterns.

7.3.4.7 *Feasibility*

No important issues with the recommended alternative

Feasibility depends on the availability of IV antibiotics, trained staff and diagnostic support. In tertiary care hospitals, the recommendation is readily implementable.

In patients with mpox, health and care workers should have a low threshold for testing for hypoglycaemia, and treat rapidly when it occurs.

From: *WHO Basic Emergency Care (BEC, 2018)* [124], *Pocket book of hospital care in children (second edition, 2013)* [152], *Integrated Management of Childhood Illnesses (2005)* [129], revalidated February 2026.

- Posters for the treatment of hypoglycaemia are available [153].
- In primary care or community settings, IMCI advises giving breastmilk, breastmilk substitute, or sugar water orally or via NG tube to treat or prevent low blood sugar before referral.
- The Basic Emergency Care guideline reinforces giving oral glucose if the patient is alert and intravenous or buccal glucose if unconscious or unable to swallow.

7.3.5 Rationale

This recommendation is supported by consistent guidance across multiple WHO sources, including the Basic Emergency Care (BEC) course, Integrated Management of Childhood Illness (IMCI), and the Pocket book of hospital care for children. These guidelines all emphasize that hypoglycaemia is a common, life-threatening and reversible emergency, particularly in children and critically ill patients [124][129][152].

The GDG considered the recommendations from the previous guidelines highly applicable to the mpox context, where children and immunocompromised individuals may present with seizures, altered mental status or other neurologic signs. The use of the AVPU scale for rapid assessment of consciousness, and a low threshold for testing blood glucose in any patient with neurological symptoms or signs of systemic illness is recommended [124].

The GDG also recommended concurrent evaluation for electrolyte abnormalities, which may co-exist with hypoglycaemia and contribute to similar clinical presentations [152].

7.3.6 Evidence to decision considerations

7.3.6.1 Benefits and harms

Substantial net benefits of the recommended alternative

Early identification and rapid correction of hypoglycaemia prevent coma, seizures and death, particularly in children and critically ill patients with mpox. The GDG emphasized the importance of rapidly assessing consciousness using the AVPU scale, checking blood glucose urgently, and evaluating for electrolyte abnormalities (such as sodium or calcium derangements) in patients presenting with seizures, altered mental status or other neurologic symptoms. The harms of glucose testing and correction are negligible; finger-prick testing and IV glucose administration are safe, low-risk and highly effective interventions.

7.3.6.2 Evidence

This recommendation was adopted from non-GRADE based WHO guidelines.

7.3.6.3 Values and preferences

No substantial variability expected

The GDG judged that patients, caregivers and clinicians place high value on preventing avoidable deterioration and death. Glucose testing and intravenous correction are widely accepted and prioritized, particularly in child health.

7.3.6.4 Resources and other considerations

No important issues with the recommended alternative

Resources such as glucometers and strips, oral glucose, IV dextrose are inexpensive and widely available even in low-resource settings. The GDG noted that in community settings, especially with IMCI, simplified protocols, such as giving oral sugar water before referral, are critical where glucometers are not available.

7.3.6.5 Equity

No important issues with the recommended alternative

Emphasizing a low threshold for testing and simple correction strategies improves equity by ensuring that all patients, regardless of setting, benefit from early detection and management.

7.3.6.6 Acceptability

No important issues with the recommended alternative

Testing is non-invasive and quick, and treatment is simple and effective. In children, parents usually welcome preventive action against seizures and neurological complications.

7.3.6.7 Feasibility

No important issues with the recommended alternative

The recommendation is feasible across all levels of care.

In patients with mpox, treat seizures promptly and consider the likely underlying cause.

From: WHO Basic Emergency Care (BEC, 2018) [124], Pocket book of hospital care in children (second edition, 2013) [152], Integrated Management of Childhood Illnesses (2005) [129], revalidated February 2026.

- Hypoglycaemia should always be ruled out or treated presumptively in patients with seizures.
- Consider underlying causes including meningitis and malaria.
- Benzodiazepines should be rapidly administered to terminate seizures unless an alternative agent is more suitable.
- Magnesium sulphate should be used in second and third trimesters of pregnancy where eclampsia is a likely diagnosis.
- Where there is a clinical picture or suspicion of meningitis or encephalitis:
- Consider lumbar puncture for cerebrospinal fluid (CSF) evaluation to evaluate for other treatable conditions.
- See [WHO Essential Medicines List antibiotic book](#) for guidance on correct antimicrobial selection and appropriate use [151].

7.3.7 Rationale

This recommendation reflects well-established WHO emergency care guidance that seizures must be terminated promptly to avoid serious complications. Although the underlying cause of seizures in mpox may vary, ranging from encephalitis, meningitis, hypoglycaemia, malaria, eclampsia or HIV-related neuroinfection, the first-line response is seizure termination, most commonly with a benzodiazepine [124].

The GDG supported the use of diazepam or midazolam, including rectal or buccal formulations where IV access is unavailable. The BEC guideline was referenced for appropriate dosing, including for children, and for monitoring for respiratory depression after administration. Lorazepam was noted as an alternative where available, and levetiracetam may be considered if accessible.

In pregnant patients, magnesium sulphate should be promptly administered where eclampsia is suspected, particularly in the second and third trimesters. For all patients, hypoglycaemia should be excluded or treated presumptively before or during seizure management.

The GDG acknowledged that this recommendation focuses on initial (first-line) seizure termination and does not provide detailed guidance on escalation or refractory seizure management, which may require specialist input.

7.3.8 Evidence to decision considerations

7.3.8.1 Benefits and harms

Substantial net benefits of the recommended alternative

Prompt seizure termination with benzodiazepines (e.g. diazepam, lorazepam, midazolam) reduces the risk of hypoxia, neurological damage, aspiration and death. The GDG emphasized early

administration of a benzodiazepine unless a more appropriate agent is indicated (e.g. magnesium sulphate in eclampsia).

Harms include respiratory depression, especially with IV benzodiazepines. These can be mitigated by close monitoring and appropriate dosing. Failure to treat seizures rapidly carries significantly greater risks.

7.3.8.2 Evidence

This recommendation was adopted from non-GRADE based WHO guidelines.

7.3.8.3 Values and preferences

No substantial variability expected

The GDG judged that patients and providers place high value on immediate seizure control and prevention of recurrence or complications. There is also strong clinical consensus around addressing underlying causes, including hypoglycaemia, eclampsia, meningitis, malaria and HIV-associated encephalopathy, especially in the context of mpox. Preferences may vary on route of administration based on lesion location (e.g. oral or buccal route if IV access is unavailable).

7.3.8.4 Resources and other considerations

No important issues with the recommended alternative

First-line medicines such as diazepam, lorazepam and midazolam are generally available, inexpensive and on the WHO Essential Medicines List. Magnesium sulphate for eclampsia and glucose for hypoglycaemia are also widely accessible. Resource challenges may arise in facilities with limited capacity for airway support or monitoring, which underscores the need for training and safety protocols.

7.3.8.5 Equity

Important issues, or potential issues not investigated

Prompt treatment of seizures reduces inequities by providing a standardized, lifesaving intervention across diverse settings. However, inequities persist where essential anticonvulsants or glucose monitoring are unavailable.

7.3.8.6 Acceptability

No important issues with the recommended alternative

This recommendation is expected to be acceptable to both clinicians and families.

7.3.8.7 Feasibility

No important issues with the recommended alternative

Intervention is likely to be feasible in most contexts, as first-line medicines are inexpensive and can be administered in primary or referral facilities. In remote or community settings, feasibility may depend on training non-specialist providers to administer benzodiazepines safely and recognize when to refer urgently. Integration into IMCI, BEC or emergency triage protocols can further enhance feasibility.

In patients with mpox, follow existing antibiotic treatment guidelines for pneumonia.

From: Pocket book of hospital care in children (second edition, 2013) [152], The WHO AWaRe (Access, Watch, Reserve) antibiotic book (2022) [149], Clinical care of severe acute respiratory infections – toolkit (2022) [121], revalidated February 2026.

- Treat mild pneumonia in patients with mpox with oral antibiotics, such as amoxicillin, co-amoxiclav or cefalexin.
- Treat severe pneumonia in patients with mpox with parenteral antibiotics, such as ceftriaxone or ampicillin-gentamicin.
- Adaptation should be based on local resistance patterns.
- Life-saving measures include the rational use of supplemental medical oxygen, non-invasive ventilation and mechanical ventilation. Further guidance is available in the [WHO Clinical care for severe acute respiratory infection toolkit \[121\]](#).

7.3.9 Rationale

The GDG judged it appropriate to extrapolate from standard pneumonia management practices due to the high risk of bacterial superinfection in individuals with mpox. Skin barrier disruption, immunosuppression (e.g. HIV) and potential delays in accessing care are important contributors to secondary bacterial infections in this population.

The use of oral antibiotics for mild pneumonia and parenteral antibiotics for severe pneumonia aligns with WHO's syndromic management protocols in resource-constrained settings [149].

7.3.10 Evidence to decision considerations

7.3.10.1 Benefits and harms

Substantial net benefits of the recommended alternative

The GDG assessed that prompt antibiotic treatment of pneumonia in mpox prevents clinical deterioration, respiratory failure and death, especially in vulnerable populations (e.g. children, pregnant women, immunocompromised individuals). Empiric antibiotics are effective in covering common pathogens. Harms such as antibiotic-related adverse effects or resistance are outweighed by the benefits.

7.3.10.2 Evidence

This recommendation was adopted from non-GRADE based WHO guidelines.

7.3.10.3 Values and preferences

No substantial variability expected

The GDG assessed that clinicians and patients place high value on treatment of pneumonia. In clinical practice, particularly where severe illness or aspiration is suspected, empiric treatment is standard and expected.

7.3.10.4 Resources and other considerations

No important issues with the recommended alternative

The recommended antibiotics are on the WHO Essential Medicines List and are generally inexpensive. Their use is feasible in outpatient settings for mild pneumonia and in hospitals for severe disease. The GDG emphasized the need to adapt antibiotic selection to local resistance patterns and align practice with national AMR stewardship policies.

7.3.10.5 Equity

No important issues with the recommended alternative

Adopting simple oral regimens for mild pneumonia and parenteral agents for severe disease promotes equity by ensuring effective, affordable treatments are available across different levels of care.

7.3.10.6 Acceptability

No important issues with the recommended alternative

The recommendation is highly acceptable to both clinicians and patients, as it aligns with established clinical practice and WHO global guidance.

7.3.10.7 Feasibility

No important issues with the recommended alternative

Implementation is feasible in most health systems, as the required antibiotics are widely available and included in existing treatment algorithms for pneumonia.

8 Symptoms and general care



8.1 Pain

Assess pain in patients with mpox and treat according to pain severity using an analgesia ladder.

From: WHO analgesia ladder [164], revalidated February 2026.

- An infographic of the [analgesia ladder for mpox](#) is available.^[165]

8.1.1 Dosing and administration - paracetamol

- Adults: 1 g PO/IV every 6–8 hours. Maximum dose 4 g every 24 hours or (max 2 g/24 h if history of chronic liver disease).
- Neonates: Oral dose 10–15 mg/kg every 6 hours. Maximum dose 40 mg/kg/day; IV dose 7.5 mg/kg every 6 hours, maximum dose 30 mg/kg day.
- All other children: 10–15 mg/kg every 6 hours, maximum dose 60 mg/kg /day.

8.1.2 Dosing and administration - tramadol

- Adults: 50–100 mg PO/IV every 4–6 hours as needed, daily maximum 400 mg/day.
- Children > 6 months: 1–2 mg/kg every 4–6 hours, maximum 400 mg/day.

8.1.3 Dosing and administration - morphine

- (PO, IV, SC) (oral dose preferred if patient can tolerate; only use immediate release tablets for acute pain)
- Adults: Oral dose is 10 mg every 4 hours as needed; maximum dose is 60 mg/day. IV dose is 1–4 mg SQ/IV every 4 hours as needed – monitor SBP and RR prior to administration of morphine (hold for low SBP or respiratory rate).
- Children: Oral dose is 0.2–0.4 mg/kg/dose every 4 hours. Titrate dose to pain. IV dose is 0.05–0.1 mg/kg/dose every 4–6 hours as required.

8.1.4 Additional analgesia options

These are not contained in the pain ladder, and are suggested based on expert opinion:

For oral lesions, rinse the mouth with clean, salt water at least four times a day ^[166]. Consider use of oral antiseptic to keep lesions clean (e.g. chlorhexidine mouthwash) or local anaesthetic (e.g. viscous lidocaine) ^{[167][168]}.

For genital or anorectal lesions warm sitz baths (warm bath made up of water and baking soda or Epsom salt to heal and cleanse the perineal, perianal, penile and vulvar area) and/or topical lidocaine may offer symptomatic relief ^[166].

8.1.5 Rationale

Pain is a frequent symptom in patients with mpox, often resulting from mucocutaneous lesions, secondary bacterial infections, or complications such as proctitis or ophthalmic involvement. Given the wide variation in pain severity and patient needs, the GDG supported a stepwise approach to analgesia selection guided by an analgesic ladder. This approach allows for individualized treatment that escalates therapy based on pain severity and response, promoting both efficacy and safety [164]. Indirect evidence was drawn from systematic reviews of low-back pain [169], cancer [170], and pediatric care [171].

Evidence from systematic reviews indicates that non-opioid analgesics such as paracetamol and NSAIDs are effective for mild to moderate pain with minimal adverse effects when used appropriately [169]. For more severe or refractory pain, opioids may be needed, but their use should be cautious and time limited [170]. A recent systematic review for pain management in children highlighted the need for individualized, severity-based pain management strategies, supporting the use of an analgesia ladder approach in conditions such as mpox [171].

8.1.6 Evidence to decision considerations

8.1.6.1 Benefits and harms

Substantial net benefits of the recommended alternative

The GDG assessed that adherence to the WHO analgesic ladder [164], which proposes a stepwise approach based on pain severity, ensures appropriate, titrated pain relief while minimizing the risk of under-treatment or opioid overuse. It allows clinicians to escalate therapy from non-opioids (e.g. paracetamol, NSAIDs) to weak or strong opioids based on need. This structured approach would reduce suffering, improve quality of life, and avoid inappropriate analgesic prescribing.

8.1.6.2 Evidence

This adopted recommendation was endorsed by expert consensus. Although no trials exist specifically for pain management in mpox, the principles of tiered pain control are well established and widely accepted globally. The WHO analgesic ladder, first introduced in the publication Cancer Pain Relief (WHO, 1986), provides a stepwise framework for selecting analgesia according to the severity of pain. The principle has since been widely applied beyond cancer to guide pain management in other conditions [164].

8.1.6.3 Values and preferences

No substantial variability expected

The GDG judged that patients highly value relief from pain, especially since mpox lesions are often widespread, mucosal or associated with secondary bacterial infection.

8.1.6.4 Resources and other considerations

No important issues with the recommended alternative

The analgesic ladder is easy to implement, scalable and adaptable to varied resource settings. Basic analgesics are usually available, and the ladder provides a clear guide for escalation.

8.1.6.5 *Equity*

No important issues with the recommended alternative

Adopting a standardized, severity-based approach reduces inequities by ensuring that all patients receive pain relief according to their needs, rather than depending on individual provider judgement or drug availability. However, inequities may persist in countries with restrictive opioid access or weak supply chains, highlighting the importance of advocacy for essential pain medicines.

8.1.6.6 *Acceptability*

No important issues with the recommended alternative

The analgesia ladder approach is acceptable to both clinicians and patients as it provides a clear framework for decision-making.

8.1.6.7 *Feasibility*

No important issues with the recommended alternative

Headache and pain from skin rash, oral, ocular and genital lesions, swollen lymph nodes and generalized muscle aches are common, and initial treatment of pain can adopt a disease-agnostic approach. The use of routine protocols is likely to make this highly feasible.

8.2 Nutrition

Encourage daily oral nutrition to meet patient needs for energy (kcal) and essential nutrients, in addition to fluids and electrolytes.

General health care principle, February 2026.

- See also screening for severe acute malnutrition
- Use ready-to-use therapeutic foods where available, particularly for:
- Children: If able to take orally per the WHO Pocket book of hospital care for children [152].
- Individuals with malnutrition or food insecurity.
- Take special care with patients at risk for refeeding (critically unwell, low BMI, reduced food intake for > 5 days, a history of alcohol abuse or receiving the following drugs: insulin, chemotherapy, antacids or diuretics) and start enteral feeding slowly with close monitoring for altered consciousness, cardiovascular compromise and laboratory abnormalities, where facilities allow.
- Where the patient is unable to take orally:
- Assess for causes (e.g. pain, lymphadenopathy, altered mental status, electrolytes).
- Assist weak patients with feeding.
- Consider nasogastric tube for supplemental nutrition if needed.
- Provide vitamin A supplements according to standard recommendations, especially for children who have not recently received a dose [157].

8.2.1 Rationale

Sufficient intake of calories, proteins, vitamins and minerals is a fundamental requirement for health. These promote physiological stability, improve immune function, support tissue repair and enhance overall resilience to illness. For health care delivery, encouraging oral nutrition typically requires low additional resource investment as it relies on providing balanced meals and dietary support already integrated into routine services. Costs may increase in cases where specialized nutritional supplements or dietitian input are needed.

8.3 Hydration

Severe dehydration and hypovolemic shock can be seen in patients with mpox due to intravascular volume loss due to extensive rash, poor oral intake associated with oropharyngeal lesions and, in a minority, gastrointestinal losses due to concurrent diarrhoea or vomiting.

The treatment for severe dehydration is resuscitation with IV/IO fluid, given as one or multiple boluses with close monitoring of fluid responsiveness. Adequate IV fluid intake refers to the volume that will correct signs of hypovolemia. The GDG considered existing disease-specific fluid guidelines, including those for cholera, but determined that recommending these for mpox (where diarrhoea is not a main feature) would be too indirect.

For adults and children, a [quick reference poster for fluid management of mpox](#) can be used to guide management [172]. For children with any-cause severe dehydration, generic guidance is available also in the [Pocket book of hospital care for children](#) [152][173].

8.4 Other symptoms

Provide symptomatic relief using medication where required.

General health care principle, February 2026.

- Prominent symptoms in mpox may include:
 - Sleep disturbance: Provide sleep hygiene advice to all patients. This may include: avoidance of caffeine, nicotine and alcohol, establishing regular sleep routine, minimizing noise and light at night, relaxation techniques (e.g. deep breathing).
 - Pruritus: Use non-sedating antihistamines for pruritus as required.
 - Persistent nausea or vomiting: Antiemetics as required.
 - Epigastric discomfort or dyspepsia: omeprazole (or other proton pump inhibitors) as required.
- A WHO [quick reference poster for pain in mpox](#) can be used to guide management [\[165\]](#).

Lymphadenopathy occurs in up to 80% of cases depending on the clade and setting. No formal recommendations have been made for the management of lymphadenopathy, but these are planned for future iterations of the guideline. General approaches include:

- Large cervical adenopathy can cause respiratory compromise.
- Patients are at risk of dehydration due to decreased food and water intake [\[173\]](#).
- Specialist consultation should be considered from surgeon, ear, nose and throat, and anaesthesiologist specialists.

9 Mpox antivirals

Recent trials of tecovirimat have reported or are in the final stages of peer-review publication. This guideline will be updated to include a recommendation on tecovirimat following the systematic review and meta-analysis of these therapeutic trials.

10 Special populations

10.1 Pregnancy

Mpox can affect pregnant women and their fetuses [174]. In utero transmission of mpox has been documented, as well as transmission from mother to child via direct contact [175][176][177]. The former is from a longitudinal case series that reported outcomes of four pregnant persons: one delivered a healthy baby, two had early miscarriages and one a fetal death where the stillborn was covered with diffuse rash with virologic confirmation of mpox. This suggests that mpox infection may lead to adverse outcomes for the fetus, such as death or spontaneous abortion [176]. A 2024 systematic review of seven studies identified 32 pregnant people with clade IIb MPXV infection between 6 and 31 weeks of gestation; 3 of the 12 pregnancies with reported gestational outcomes, half of them resulted in intrauterine fetal demise [178]. The association between severity of maternal illness and these outcomes is unclear [176][179].



WHO recommends that a pregnant woman with mpox should receive enhanced monitoring to improve maternal and fetal survival. This may be delivered at home or in a health facility depending on the severity of disease, access to specialist services, and the ability to provide appropriate frequent monitoring in the community.

From: WHO recommendations on antenatal care for a positive pregnancy experience (2016) [138], WHO recommendations on maternal and newborn care for a positive postnatal experience (2022) [139], revalidated February 2026.

- Provide information related to the potential risk of adverse pregnancy outcomes and offered counselling when they request or desire it.
- All pregnant women with confirmed mpox and their infants should be followed up through national registries for signs of complications.
- For home care, counsel women about maternal, fetal and newborn signs and to seek care if they develop worsening illness or danger signs.
- For patients requiring abortion services, consider alternative modes of service delivery, including self-management of medical abortion up to 12 weeks' gestation, where women have access to accurate information and to a health care provider at any stage of the process, per the WHO Abortion care guideline [140].
- Counsel patients about healthy behaviours including diet, physical activity, intake of micronutrients, tobacco, alcohol and other substance use, per WHO recommendations on antenatal and postnatal care [138][139].
- Counsel patients about healthy diet, mobility and exercise, intake of micronutrients for themselves and their infant, tobacco use and second-hand smoke exposure, use of alcohol and other substances, as per WHO recommendations on antenatal care for a positive pregnancy experience and WHO recommendations on maternal and newborn care for a positive postnatal experience [138][139].

10.1.1 Rationale

Limited data suggest that mpox virus infection in pregnant women may lead to vertical transmission as well as adverse outcome for the fetus, such as spontaneous abortion and stillbirth [65][176][178][179].

10.1.2 Evidence to decision considerations

10.1.2.1 Benefits and harms

Substantial net benefits of the recommended alternative

Enhanced monitoring allows for early detection of maternal or fetal deterioration, timely intervention and prevention of severe complications or death. It also enables appropriate referral to higher level care when needed. There are no direct anticipated harms of monitoring. Anticipated benefits may outweigh inconvenience and costs from visits to facility.

10.1.2.2 Values and preferences

No substantial variability expected

The GDG judged that pregnant women and health care providers would highly value close monitoring to ensure fetal survival and maternal safety.

10.1.2.3 Resources and other considerations

Important issues, or potential issues not investigated

Enhanced monitoring requires resources such as trained health workers, antenatal equipment and referral capacity.

10.1.2.4 Equity

No important issues with the recommended alternative

Enhanced monitoring helps reduce inequities by prioritizing follow-up and ensuring early detection of complications. However, inequities may persist where registries and referral systems are unavailable.

10.1.2.5 Acceptability

No important issues with the recommended alternative

Counselling on risk, healthy behaviours (diet, micronutrient supplementation, physical activity, avoidance of tobacco and alcohol) and sexual and reproductive rights is well aligned with WHO antenatal and postnatal care guidelines.

10.1.2.6 Feasibility

No important issues with the recommended alternative

Enhanced monitoring is feasible when adapted to context. The GDG emphasized the need for adaptable protocols, including counselling on maternal, fetal and newborn danger signs, and clear referral pathways.

WHO recommends that pregnant and recently pregnant women with mpox receive care for missed abortion or intrauterine fetal death according to existing guidelines.

From: WHO recommendations on maternal and newborn care for a positive postnatal experience (2022) [139], WHO Abortion care guideline (2022) [140], revalidated February 2026.

- Patient choices and rights to sexual and reproductive health care should be respected, including access to contraception and safe abortion [140].
- Pregnant women with mpox should be informed that it is unknown whether transmission can occur if others are exposed to pregnancy-related fluids or tissues, such as amniotic fluid, placenta or fetal tissue. Instructions should be provided on how to handle potentially infectious specimens.
- Counsel pregnant persons on safe sexual practices.

10.1.3 Rationale

Limited data suggest that mpox virus infection in pregnant persons may lead to vertical transmission as well as adverse outcome for the fetus, such as spontaneous abortion and stillbirths [65][176][178][179].

This recommendation affirms that pregnant and recently pregnant individuals with mpox who experience pregnancy loss should receive the same standard of care as those without mpox, in accordance with existing WHO abortion care guidelines. The GDG noted that mpox may increase the risk of complications due to systemic illness, fever and secondary infections.

10.1.4 Evidence to decision considerations

10.1.4.1 Benefits and harms

Substantial net benefits of the recommended alternative

Timely and appropriate management of missed abortion or intrauterine fetal death reduces maternal morbidity (e.g. infection, haemorrhage) and psychological distress. Adhering to established protocols ensures safe uterine evacuation and monitoring for complications.

10.1.4.2 Values and preferences

No substantial variability expected

The GDG judged that pregnant individuals would place high value on receiving timely and safe abortion practices.

10.1.4.3 Resources and other considerations

Important issues, or potential issues not investigated

The interventions required, medical abortion medicines, uterotonics, manual vacuum aspiration equipment, antibiotics and counselling services, are generally available in many health systems but may be unevenly distributed.

10.1.4.4 Equity

No important issues with the recommended alternative

Ensuring that all women with mpox have access to standard care for missed abortion and intrauterine fetal death reduces inequities, particularly in low-resource settings where maternal mortality from unsafe or incomplete abortion is higher.

10.1.4.5 Acceptability

No important issues with the recommended alternative

This recommendation is acceptable to patients and clinicians, as it relies on established international standards of care.

10.1.4.6 Feasibility

No important issues with the recommended alternative

The recommendation is feasible where maternal health services are functional.

WHO recommends that mode of birth should be individualized, based on obstetric indications and the mother's preferences. WHO recommends that induction of labour and caesarean section should only be undertaken when medically justified and based on maternal and fetal condition.

From: WHO recommendations on antenatal care for a positive pregnancy experience (2016) [138], WHO recommendations on maternal and newborn care for a positive postnatal experience (2022) [139], revalidated February 2026.

- Interventions to accelerate labour and childbirth (e.g. augmentation, episiotomy, operative vaginal birth) should only be undertaken if medically justified and based on maternal and fetal clinical condition per the WHO recommendations for intrapartum care [180].
- Delayed umbilical cord clamping (not earlier than 1 minute after birth) is recommended for improved maternal and infant health and nutrition outcomes. There is no evidence that delaying cord clamping increases the possibility of viral transmission from the mother to the newborn. The proven benefits of a 1–3 minute delay, at least, in clamping the cord outweigh the theoretical, and unproven, harms.
- Individualized decisions should be taken about postponing planned (elective) induction or caesarean section in pregnant woman with suspected or confirmed mild mpox [181].
- Placenta and any pregnancy related tissue or fluids, such as amniotic or fetal tissue fluid, must be disposed of following specific IPC protocols for potentially infectious materials.

10.1.5 Rationale

Emergency decisions about childbirth and pregnancy termination are complex and depend on various factors, including gestational age, the severity of the maternal condition, fetal viability and well-being, as well as regulatory and legal barriers in the country or state.

The GDG considered these recommendations to be of continued relevance. No new evidence was presented.

10.2 Breastfeeding

The current recommendations on breastfeeding outside of the mpox context were summarized by the technical working group (see Methods section) to provide foundational evidence for mpox guideline development. They noted that WHO has existing guidelines which pertained, specifically Recommendations on postnatal care of the mother and newborn [182].

WHO recommends that “All babies should be exclusively breastfed from birth until 6 months of age. Mothers should be counselled and provided support for exclusive breastfeeding at each postnatal contact (Strong recommendation, based on moderate quality evidence).

- This recommendation is applicable in all settings.
- Exclusive breastfeeding should be promoted during all antenatal and postnatal care contact.
- Particular support for exclusive breastfeeding should be provided when the mother has had a caesarean section or the baby is born preterm.

WHO low-birth-weight feeding guidelines for low- and middle-income countries recommend exclusive breastfeeding for all preterm and low-birth-weight infants (<https://iris.who.int/handle/10665/85670>) [183].

The GDG reviewed evidence for neonatal outcomes; the 6-month duration of exclusive breastfeeding is based on existing WHO recommendation and an updated Cochrane review.

The technical group structured the PICOs below to address separately the risk of mother-to-child transmission of mpox through two potential routes, via breastmilk or via direct contact. The final PICO addresses whether mothers who recover from mpox and who had withheld breastfeeding and direct contact should resume breastfeeding and direct contact with the infant.

WHO suggests that mothers with mpox continue breastfeeding, whilst limiting direct contact with their non-infected infant, until lesions are fully resolved (lesions are crusted, the scab of lesions have fallen off and a fresh layer of intact skin has formed underneath).

Conditional recommendation, low certainty evidence, May 2025.

- If breastfeeding is continued between a suspected or confirmed mother with mpox and a non-infected infant, IPC measures must be established including limited contact between mother and infant except during breastfeeding and coverage of active lesions on other parts of the body whilst breastfeeding.
- The presence of areolar lesions should prompt careful consideration and mothers should not use that breast to breastfeed the infant. In the case of unilateral lesions, until lesions are healed per WHO criteria (lesions are crusted, the scab of lesions have fallen off and a fresh layer of intact skin has formed underneath), breastfeeding may take place from the unaffected breast whilst covering all active lesions.
- Health and care workers should inform the mother about the risk of infection to infants whilst breastfeeding and availability of appropriate alternatives.
- Context will drive the feasibility, availability and safety of alternatives to breastfeeding. Whenever it is safe and feasible, expressed breastmilk or milk substitutes and no direct contact, may be pursued to reduce transmission.

Additional guidance on breastfeeding can be found in WHO Recommendations on postnatal care of the mother and newborn and can be accessed here: <https://iris.who.int/handle/10665/97603> [182].

General protective IPC measures should be taken by mothers with mpox when handling and feeding their infants, e.g. washing hands before and after each feeding, wearing a medical mask and covering any lesions on the areola or on areas which have direct contact with the infant.

Alternatively, if only one breast has lesions, mothers can express/pump from the breast with lesions on the areola and discard the milk and feed from the non-affected breast. In all cases, monitor the mother-infant pair closely for development of signs and symptoms of mpox and treat accordingly. Infants of mothers with mpox should be closely monitored for signs and symptoms with the main goal of early supportive care to prevent the development of severe disease and poor outcomes. In the event of replacement feeding with breastmilk substitute, it is essential to track the infant's growth, development and other illnesses as well as for signs and symptoms of mpox.

10.2.1 Rationale

Review of technical guidance was provided by the [breastfeeding technical working group](#).

Overall, the certainty of evidence about breastfeeding of mothers with mpox to their infants was rated as moderate to very low. The GDG felt that no strong recommendation could be made given the certainty of the evidence available.

The GDG considered the benefits of continuing breastfeeding by a mother with mpox infection are based on moderate certainty evidence that exclusively breastfed neonates are at lower risk of all-cause mortality and infection-related mortality in the first month of life compared with partially breastfed neonates.

The GDG also considered in their deliberations that alternatives to breastfeeding may be not feasible or not safe and expose the infant to harm. In settings where alternatives to breastfeeding (appropriate milk substitutes) are not feasible, available and safe, the panel inferred that most parents would place higher value on the possible beneficial effects of breastfeeding with direct contact or expressed milk (no direct contact) over eliminating the uncertain magnitude of risk of infants getting infected with mpox via breastfeeding. The GDG also noted there is little research available on parent preferences and this should be highlighted as a further area of research.

In considering harms and risks, the GDG also reflected that in the pre-symptomatic stage, before the lesions emerge and before the mother has presented for treatment, the infant may have already been already exposed. If that is the case, there may be little benefit in subsequent avoidance of breastfeeding. Additionally, lesions in other parts of the body, in the context of intimate care of an infant may make an isolated recommendation on breastfeeding have little impact on the likelihood of the infant being infected.

All these considerations support the conditional recommendation for continuing breastfeeding.

10.2.2 Evidence to decision considerations

10.2.2.1 *Benefits and harms*

The benefits of continuing breastfeeding are based on the moderate quality evidence that exclusively breastfed neonates are at lower risk of all-cause mortality and infection-related mortality in the first month of life compared with partially breastfed neonates. Also, there is low-quality evidence that exclusively breastfed neonates are at lower risk of sepsis, acute respiratory infection and diarrhoea in the first month of life compared with partially breastfed neonates.

Harms of continuing breastfeeding include the risk of transmission of infection to the infant through contact with lesions or expressed milk. The evidence available about transmission through expressed milk (with no contact) due to presence of viable virus in the milk is limited.

10.2.2.2 *Evidence*

The certainty of the evidence ranged between moderate and very low.

Aside from the indirect evidence regarding the impact of breastfeeding, seven publications providing potentially direct evidence were identified; five were case reports and two were case series. However, in none of these studies was there clarity about the existence of lesions specifically on the breasts.

Six of these studies report on breastfeeding and direct contact. In five of the studies, the infant was infected compared with no infant being infected in the one study that reported on no breastfeeding and no contact. There was moderate certainty evidence that breastfeeding and direct contact between mothers with mpox with no lesions on the breasts probably resulted in infection of some infants. However, there is less clarity about the frequency of this event. There was, however, very low certainty evidence of the magnitude of any increase of mpox infection in infants as a result of breastfeeding and direct contact with mother with mpox and no lesions on the breasts.

Regarding hospitalization of infants due to mpox infection, four out of six infants who were breastfed and had close contact were hospitalized compared with the no breastfeeding and no

direct contact (the case hospitalized in the group of no breastfeeding and no direct contact was to monitor the infant and not because of infection).

Concerning mortality, there was one death in the breastfeeding and direct contact group compared with the no breastfeeding and no direct contact. There was low certainty of evidence for breastfeeding and direct contact and increase of infant mortality and very low certainty regarding the magnitude of any increase in infant deaths that may occur as a result of breastfeeding and direct contact between mothers with mpox with no lesions on the breasts and the infant.

There was only one case report that described breastfeeding and no direct contact. The certainty of evidence was rated very low due to lack of clarity of how breastfeeding and no direct contact (e.g. expressed milk) affects the risk of infection, hospitalization and mortality of the infant.

No adverse events were reported in any of the studies.

No studies reported on infants of mothers with confirmed mpox infection and lesions on the breasts. Therefore, we do not have published evidence on the effect of breastfeeding and close contact with the infant when the mother has lesions on the breasts.

10.2.2.3 Values and preferences

Substantial variability is expected or uncertain

There is likely to be substantial variability in values and preferences between mothers, and these are related to the availability and safety of the resources to use as milk substitutes, as well as beliefs, religion, culture and family traditions.

No formal studies are available to inform patient values and preferences in mpox. Nevertheless, the panel inferred that parents generally and strongly wish to avoid harms to their babies. At the same time, experience from Ebola virus disease and from mpox outbreaks in the Democratic Republic of the Congo reported by panel members suggests that when faced with competing priorities of harm reduction and the desirability of breastfeeding, mothers valued breastfeeding highly.

In settings in which alternatives to breastfeeding (appropriate milk substitutes) are not feasible, available and safe, the panel inferred that most parents would place a higher value on the possible beneficial effects of breastfeeding with direct contact or expressed milk (no direct contact) over eliminating the uncertain magnitude of risk of infants getting infected with mpox.

10.2.2.4 Resources and other considerations

Important issues, or potential issues not investigated

The affordability of alternatives to breastfeeding in many contexts may be limited, and costs will more likely fall on the family or the health care system. The GDG noted the complexities of providing safe breastmilk substitutes including the requirement for available safe water and equipment to provide it.

There were significant other resources required in terms of IPC measures irrespective of the choice of breastfeeding or not.

During the PALM007 study in the Democratic Republic of the Congo, breastmilk substitute was provided as part of the research, but that apart from this support, mothers would not usually have

access to it. Outside of research settings, downstream events occurring as a result of not - breastfeeding may have a significant cost and resource implication, especially following diarrhoeal disease or malnutrition.

10.2.2.5 Equity

Increasing costs associated with use of alternatives to breastfeeding could drive inequity or increase pre-existing inequities.

10.2.2.6 Acceptability

Breastfeeding is accepted and promoted in all settings and environments as the best option for infant feeding.

10.2.2.7 Feasibility

There is large heterogeneity in accessibility to alternatives to breastfeeding (see Resources, above). Specifically, the potential to pasteurize breastmilk was also noted, but felt to be not feasible in many contexts.

WHO suggests that mothers who recover from mpox and who had withheld breastfeeding and direct contact, to resume breastfeeding and direct contact with the infant as soon as lesions are fully resolved (lesions are crusted, the scab of lesions have fallen off and a fresh layer of intact skin has formed underneath).

Conditional recommendation, very low certainty evidence, May 2025.

- This recommendation applies to mothers with confirmed mpox who withheld breastfeeding and close contact with their infant.
- The mother needs to be supported to continue to express milk while not breastfeeding to maximize the likelihood of reinitiating breastfeeding once recovers and avoid complications (e.g. mastitis).

Additional guidance on breastfeeding can be found in WHO recommendations on postnatal care of the mother and newborn (2013) and can be accessed here:

<https://iris.who.int/handle/10665/97603> [182].

10.2.3 Rationale

Review of technical guidance was provided by the breastfeeding technical working group.

Overall there was very low certainty evidence which precluded a strong recommendation.

The GDG discussed alternative ascertainment of the time point at which breastfeeding might be reinitiated. Two weeks was used as an initial practical threshold considering the ability to maintain lactation through expression of breastmilk and lesion resolution. However, the GDG agreed to adopt the dermatological definition of recovery: “when lesions have crusted over, the scabs have fallen off and a new layer of skin has formed underneath, and all the lesions on the eyes and in the body (in the mouth, throat, eyes, vagina and anus) have healed” as clinical progression may vary at the individual patient level.

Recommencing breastfeeding will benefit both mother and infant and infection of the infant once lesions are healed is likely to be low.

10.2.4 Evidence to decision considerations

10.2.4.1 Benefits and harms

Substantial net benefits of the recommended alternative

The benefits of resuming breastfeeding are based in the moderate quality evidence that exclusively breastfed neonates are at lower risk of all-cause mortality and infection-related mortality in the first month of life compared with partially breastfed neonates. Also, there is low-quality evidence that exclusively breastfed neonates are at lower risk of sepsis, acute respiratory infection and diarrhoea morbidity in the first month of life compared with partially breastfed neonates.

Harms of resuming breastfeeding after recovery include the risk of transmission of infection to the infant through persistence of virus in the breastmilk of recovered mothers. Evidence around presence of viable virus in the milk after is limited.

10.2.4.2 Evidence

All evidence is of very low certainty, including infection, hospitalization and infant mortality endpoints, as it was derived from two case reports. One of these reports was in the context of less than 2 weeks' post resolution of lesions and the other in more than 2 weeks' post lesion resolution.

There were no events in either group for infection, hospitalization or mortality of the infant. Adverse events were not reported.

10.2.4.3 Values and preferences

Substantial variability is expected or uncertain

There was likely to be a substantial variability in values and preferences, and these are closely related to the available resources.

No data are available from the literature to inform on patients' values and preferences in mpox specifically. The panel noted that parents generally and strongly wish to avoid harms to their babies. Experience from Ebola virus disease and mpox outbreaks in the Democratic Republic of the Congo reported by panel members suggests that in these circumstances, mothers valued breastfeeding despite the known potential for transmission of disease.

Most parents would place higher value on the possible beneficial effects of breastfeeding with direct contact over reducing the uncertain magnitude of risk of infants getting infected with mpox and the possible serious consequences with feeding infants expressed milk (no direct contact).

10.2.4.4 Resources and other considerations

Important issues, or potential issues not investigated

The affordability of alternatives to breastfeeding was questioned in many contexts, and these costs will more likely fall on the family or the health care system. The complexities of providing safe breastmilk substitutes include the requirement for available safe water and equipment to provide it.

There were significant other resources required in terms of IPC irrespective of the choice of breastfeeding or not.

It was noted that during the PALM007 study in the Democratic Republic of the Congo breastmilk substitutes were provided as part of the research, but that apart from this support, mothers would not usually have access to it. Outside of research settings, downstream events occurring as a result of not breastfeeding may have a significant cost and resource implication, especially following diarrhoeal disease or malnutrition if it occurs.

10.2.4.5 Equity

Important issues, or potential issues not investigated

Increasing costs associated with alternatives to breastfeeding could drive inequity.

10.2.4.6 Acceptability

No important issues with the recommended alternative

Breastfeeding is accepted and promoted in all settings and environments as the best option for infant feeding.

10.2.4.7 *Feasibility*

Important issues, or potential issues not investigated

There is large variability in access to alternatives to breastfeeding (see Resources, above).

11 Knowledge gaps and research priorities

While formulating recommendations and prioritizing questions for this guideline, the GDG identified key areas of uncertainty, and in which they felt research would enable future recommendations to be made with higher certainty.

11.1 Transmission

- Limited epidemiological evidence on pre-symptomatic or asymptomatic phases of disease.
- Routes for human-human transmission, including how viral dynamics and trajectories correlate with viral culture in the various bodily fluids and the impact of this on transmission, infectious periods, subgroup by disease manifestation and disease severity.
- Potential for reverse zoonosis and spillback events.
- Natural history of disease: disease severity and risk factors for severe, disease in different subpopulations (neonates, children and young people, immunosuppressed, pregnant women and older persons).
- Difference and similarities in transmissibility between clade I (a and b), clade II (a and b).
- Risks related to particle and aerosol-generating activities (e.g. shaking linen).
- Infectious dose of MPXV in humans.
- Characterization of viral evolution.
- Wastewater sampling and predicting trends for outbreak response.

11.2 Clinical management

- Establish disease severity classification and risk factors for severity.
- Co-infection: other viruses (varicella zoster [VZV], HIV), STIs (such as herpes simplex virus [HSV], syphilis, chancroid, lymphogranuloma venereum [LGV]) and others, parasitic infections (malaria, dengue, filariasis) etc. Understand if co-infection impacts disease severity.
- Clinical management of patients with advanced HIV and mpox.
- The incidence of IRIS and its contribution to morbidity and mortality.
- Racial and ethnic disparities in incidence and access to countermeasures and care.
- Best symptomatic care for skin care, rash management, nutrition.
- Best optimized care package for complications such as ocular and central nervous system complications.
- Long-term outcomes for recovered patients, including mothers and babies, immunosuppressed patients. Evidence of post viral syndrome and clinical presentation.
- Efficacy and safety of therapeutics, including in pregnant and breastfeeding mothers and children.
- Presence and transmission of mpox through breastmilk. Measures to inactivate mpox virus to make the breastmilk safe (e.g. pasteurization) [184].

11.3 Infection prevention and control

- Description of close proximity and impact on transmission.

- Effectiveness of covering lesions and impact on fomite/environmental contamination.
- Health worker exposure risk categories and post-exposure prophylaxis (PEP).
- Susceptibility of the mpox virus to disinfectants and their virucidal properties (i.e. active ingredients and concentrations, contact time).
- Stability of virus in the environment and on surfaces.
- Optimal ventilation to reduce disease transmission.
- Duration of transmission-based precautions to maintain patients in isolation (when can transmission-based precautions be lifted).
- Effects of home-based care (what can be learned, models of care, etc.).
- Effectiveness of isolation at home to prevent transmission.

11.4 Methods questions

- Value and preference surveys of affected populations to understand trade-offs which would be considered when seeking or choosing a treatment/intervention.

11.5 Standardized data collection

In order to fill knowledge gaps, it is important to understand the clinical features, prognostic factors and outcomes. The WHO Global Clinical Platform collects patient-level anonymized clinical data and has been used to understand various emerging pathogens. As we work to understand more about the current cases, we have developed a case report form for mpox, and invite Member States to contribute data to this platform.

The objectives of the platform are:

- Describe the clinical characteristics of mpox.
- Assess the variations in clinical characteristics of mpox.
- Identify the association of clinical characteristics of mpox with symptoms.
- Describe temporal trends in clinical characteristics of mpox.

For more details, please see the WHO Global Clinical Platform for mpox website [\[185\]](#).

A statistical analysis plan is available [\[186\]](#).

12 Additional tools

This guideline is available in different formats

- [WHO document repository version \(PDF\)](#).
- [MAGICapp in online, multilayered formats](#): This is the fullest version of the guideline.
- Other tools
- [WHO website mpox clinical management webpage](#) includes tools and infographics about clinical diagnosis and management of patients with mpox.
- [Health emergencies - infection prevention and control and water sanitation and hygiene webpage](#)
- [Atlas of mpox lesions: a tool for clinical researchers \[43\]](#)
- Posters and wall charts for quick reference, covering:
- [screening for mpox \[187\]](#)
- [triage and clinical assessment \[188\]](#)
- [differential diagnosis \[189\]](#)
- [mpox related skin care \[127\]](#)
- [mpox-associated eye disease \[156\]](#)
- [pain management in mpox \[165\]](#)
- [fluid management in mpox \[172\]](#)
- [Interim practical manual for designing, setting up and assessing health facilities in the context of mpox outbreaks \(2024\) \[190\]](#)

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References

- World Health Organization. Clinical Management and infection prevention and control for monkeypox: Interim response guidance. World Health Organization; 2022. <https://iris.who.int/handle/10665/355798> (CC BY-NC-SA 3.0 IGO licence).
- World Health Organization. Second meeting of the International Health Regulations (2005) Emergency Committee regarding the upsurge of mpox 2024. WHO statement. 28 November 2024. <https://www.who.int/news/item/28-11-2024-second-meeting-of-the-international-health-regulations-%282005%29-emergency-committee-regarding-the-upsurge-of-mpox-2024> (accessed 27 August 2026).
- World Health Organization. Global mpox trends. Geneva: WHO 2025. https://worldhealthorg.shinyapps.io/mpox_global/ (accessed 27 August 2026).
- Bunge EM, Hoet B, Chen L, Lienert F, Weidenthaler H, Baer LR, et al. The changing epidemiology of human monkeypox—A potential threat? A systematic review. Gromowski G, editor. PLoS Negl Trop Dis. 2022;16(2):e0010141. <https://doi.org/10.1371/journal.pntd.0010141>.
- Vasudevan SS, Kandrikar TY, Cooner P, Jeswani BM, Batarseh SF, Sayed A, et al. Global and regional mortality rate statistics of mpox (formerly monkeypox): a comprehensive systematic review and meta-analysis. Pathogens and Global Health. 2025;119(7):293–303 <https://doi.org/10.1080/20477724.2025.2551507>.
- World Health Organization. Broader transmission of mpox due to clade 1b MPXV – Global situation. Disease outbreak News, 5 December 2025. <https://www.who.int/emergencies/disease-outbreak-news/item/2025-DON587> (accessed 27 August 2026).
- Magnus PV, Andersen EK, Petersen KB, Birch-Andersen A. A POX-LIKE DISEASE IN CYNOMOLGUS MONKEYS. Acta Pathologica Microbiologica Scandinavica. 1959;46(2):156–76. <https://doi.org/10.1111/j.1699-0463.1959.tb00328.x>.
- Ladnyj ID, Ziegler P, Kima E. A human infection caused by monkeypox virus in Basankusu Territory, Democratic Republic of the Congo. Bull World Health Organization. 1972;46(5):593–7. <https://www.ncbi.nlm.nih.gov/pubmed/4340218>.
- Jezeq Z, Grab B, Szczeniowski MV, Paluku KM, Mutombo M. Human monkeypox; secondary attack rates. Bulletin World Health Organization 1988;66 (4):465–70 <https://pmc.ncbi.nlm.nih.gov/articles/PMC2491159/>
- Brown K, Leggat P. Human Monkeypox: Current State of Knowledge and Implications for the Future. TropicalMed. 2016;1(1):8. <https://doi.org/10.3390/tropicalmed1010008>.
- Likos AM, Sammons SA, Olson VA, Frace AM, Li Y, Olsen-Rasmussen M, et al. A tale of two clades: monkeypox viruses. Journal of General Virology. 2005;86(10):2661–72. <https://doi.org/10.1099/vir.0.81215-0>.
- Kibungu EM, Vakaniaki EH, Kinganda-Lusamaki E, Kalonji-Mukendi T, Pukuta E, Hoff NA, et al. Clade I-Associated Mpox Cases Associated with Sexual Contact, the Democratic Republic of the Congo. Emerg Infect Dis. 2024;30(1). <https://doi.org/10.3201/eid3001.231164>.
- Masirika LM, Udaheureka JC, Schuele L, Nieuwenhuijse DF, Ndishimye P, Boter M, et al. Epidemiological and genomic evolution of the ongoing outbreak of clade Ib mpox virus in the eastern Democratic Republic of the Congo. Nat Med. 2025;31(5):1459–63. <https://doi.org/10.1038/s41591-025-03582-1>.
- Americo JL, Earl PL, Moss B. Virulence differences of mpox (monkeypox) virus clades I, IIa, and IIb.1 in a small animal model. Proc Natl Acad Sci USA. 2023;120(8):e2220415120. <https://doi.org/10.1073/pnas.2220415120>.
- Parker E, Omah IF, Djuicy DD, Magee A, Tomkins-Tinch CH, Otieno JR, et al. Genomics reveals zoonotic and sustained human mpox spread in West Africa. Nature. 2025;643(8074):1343–51. <https://doi.org/10.1038/s41586-025-09128-2>.
- Laurenson-Schafer H, Sklenovská N, Hoxha A, Kerr SM, Ndumbi P, Fitzner J, et al. Description of the first global outbreak of mpox: an analysis of global surveillance data. The Lancet Global Health. 2023;11(7):e1012–23. [https://doi.org/10.1016/S2214-109X\(23\)00198-5](https://doi.org/10.1016/S2214-109X(23)00198-5).
- Vaughan AM, Afzal M, Nannapaneni P, Leroy M, Andrianou X, Pires J, et al. Continued circulation of mpox: an epidemiological and phylogenetic assessment, European Region, 2023 to 2024. Eurosurveillance. 2024;29(27). <https://doi.org/10.2807/1560-7917.ES.2024.29.27.2400330>.
- Centers for Disease Control and Prevention, MPOX: Clinical Recognition, 2023. <https://stacks.cdc.gov/view/cdc/126293> (accessed 27 August 2026).
- McCollum AM, Damon IK. Human Monkeypox. Clinical Infectious Diseases. 2014;58(2):260–7. <https://doi.org/10.1093/cid/cit703>.

20. World Health Organization. Multi-country outbreak of mpox. External situation report #18, 16 March. 2023. <https://www.who.int/publications/m/item/multi-country-outbreak-of-mpox--external-situation-report--18---16-march-2023> (accessed 27 August 2026).
21. Damon IK. Smallpox, Monkeypox, and Other Poxvirus Infections. In: Goldman's Cecil Medicine. Elsevier; 2012. p. 2117–21. <https://doi.org/10.1016/B978-1-4377-1604-7.00380-8>.
22. Pittman PR, Martin JW, Kingebehi PM, Tamfum JJM, Mwema G, Wan Q, et al. Clinical characterization and placental pathology of mpox infection in hospitalized patients in the Democratic Republic of the Congo. Bowman N, editor. PLoS Negl Trop Dis. 2023;17(4):e0010384. <https://doi.org/10.1371/journal.pntd.0010384>.
23. Damon IK. Status of human monkeypox: clinical disease, epidemiology and research. Vaccine. 2011;29:D54–9. <https://doi.org/10.1016/j.vaccine.2011.04.014>.
24. Adler H, Gould S, Hine P, Snell LB, Wong W, Houlihan CF, et al. Clinical features and management of human monkeypox: a retrospective observational study in the UK. The Lancet Infectious Diseases. 2022;22(8):1153–62. [https://doi.org/10.1016/S1473-3099\(22\)00228-6](https://doi.org/10.1016/S1473-3099(22)00228-6).
25. Nalca A, Rimoin AW, Bavari S, Whitehouse CA. Reemergence of monkeypox: prevalence, diagnostics and countermeasures. Clinical infectious diseases 2005;41 (12):1765 – 1771. <https://doi.org/10.1086/498155>
26. Prasad S, Galvan Casas C, Strahan AG, Fuller LC, Peebles K, Carugno A, et al. A dermatologic assessment of 101 mpox (monkeypox) cases from 13 countries during the 2022 outbreak: Skin lesion morphology, clinical course, and scarring. Journal of the American Academy of Dermatology. 2023;88(5):1066–73. <https://doi.org/10.1016/j.jaad.2022.12.035>.
27. Català A, Muñoz-Santos C, Galván-Casas C, Roncero Riesco M, Revilla Nebreda D, Solá-Truyols A, et al. Cutaneous reactions after SARS-CoV-2 vaccination: a cross-sectional Spanish nationwide study of 405 cases. British Journal of Dermatology. 2022;186(1):142–52. <https://doi.org/10.1111/bjd.20639>.
28. Tarín-Vicente EJ, Alemany A, Agud-Dios M, Ubals M, Suñer C, Antón A, et al. Clinical presentation and virological assessment of confirmed human monkeypox virus cases in Spain: a prospective observational cohort study. The Lancet. 2022;400(10353):661–9. [https://doi.org/10.1016/S0140-6736\(22\)01436-2](https://doi.org/10.1016/S0140-6736(22)01436-2).
29. Low N, Bachmann LH, Ogoina D, McDonald R, Ipekci AM, Quilter LAS, et al. Mpox virus and transmission through sexual contact: Defining the research agenda. PLoS Med. 2023;20(1):e1004163. <https://doi.org/10.1371/journal.pmed.1004163>.
30. Bruzzesi E, Raccagni AR, Mileto D, Candela C, Canetti D, Castagna A, et al. Isolated monkeypox proctitis among men who have sex with men. Infection. 2023;51(5):1597–8. <https://doi.org/10.1007/s15010-023-02051-6>.
31. Thornhill JP, Barkati S, Walmsley S, Rockstroh J, Antinori A, Harrison LB, et al. Monkeypox Virus Infection in Humans across 16 Countries — April–June 2022. N Engl J Med. 2022;387(8):679–91. <https://doi.org/10.1056/NEJMoa2207323>.
32. Huhn GD, Bauer AM, Yorita K, Graham MB, Sejvar J, Likos A, et al. Clinical Characteristics of Human Monkeypox, and Risk Factors for Severe Disease. Clinical Infectious Diseases. 2005;41(12):1742–51. <https://doi.org/10.1086/498115>.
33. Petersen E, Kantele A, Koopmans M, Asogun D, Yinka-Ogunleye A, Ihekweazu C, et al. Human Monkeypox. Infectious Disease Clinics of North America. 2019;33(4):1027–43. <https://doi.org/10.1016/j.idc.2019.03.001>.
34. Miller MJ, Cash-Goldwasser S, Marx GE, Schrodt CA, Kimball A, Padgett K, et al. Severe Monkeypox in Hospitalized Patients — United States, August 10–October 10, 2022. MMWR Morb Mortal Wkly Rep. 2022;71(44):1412–7. <https://doi.org/10.15585/mmwr.mm7144e1>.
35. Angelo KM, Smith T, Camprubí-Ferrer D, Balerdi-Sarasola L, Díaz Menéndez M, Servera-Negre G, et al. Epidemiological and clinical characteristics of patients with monkeypox in the GeoSentinel Network: a cross-sectional study. The Lancet Infectious Diseases. 2023;23(2):196–206. [https://doi.org/10.1016/S1473-3099\(22\)00651-X](https://doi.org/10.1016/S1473-3099(22)00651-X).
36. Mitjà O, Alemany A, Marks M, Lezama Mora JI, Rodríguez-Aldama JC, Torres Silva MS, et al. Mpox in people with advanced HIV infection: a global case series. The Lancet. 2023;401(10380):939–49. [https://doi.org/10.1016/S0140-6736\(23\)00273-8](https://doi.org/10.1016/S0140-6736(23)00273-8).
37. Yinka-Ogunleye A, Aruna O, Dalhat M, Ogoina D, McCollum A, Disu Y, et al. Outbreak of human monkeypox in Nigeria in 2017–18: a clinical and epidemiological report. The Lancet Infectious Diseases. 2019;19(8):872–9. [https://doi.org/10.1016/S1473-3099\(19\)30294-4](https://doi.org/10.1016/S1473-3099(19)30294-4).
38. Ogoina D, Iroezindu M, James HI, Oladokun R, Yinka-Ogunleye A, Wakama P, et al. Clinical Course and Outcome of Human Monkeypox in Nigeria. Clinical Infectious Diseases. 2020;71(8):e210–4. <https://doi.org/10.1093/cid/ciaa143>.
39. The PALM007 Writing Group. Tecovirimat for Clade I MPXV Infection in the Democratic

- Republic of Congo. *N Engl J Med*. 2025;392(15):1484–96. <https://doi.org/10.1056/NEJMoa2412439>.
40. Vakaniaki EH, Barhishindi I, Mubiala A, Malembaka EB, Braunack-Mayer L, Nganga B, et al. Maternal and neonatal outcomes after infection with monkeypox virus clade I during pregnancy in DR Congo: a pooled, prospective cohort study. *The Lancet*. 2026;407(10525):256–66. [https://doi.org/10.1016/S0140-6736\(25\)02309-8](https://doi.org/10.1016/S0140-6736(25)02309-8).
 41. Gao Y, Guyatt GH, Zhao W, Lian R, Liu M, Zhao Y, et al. Global Burden of Mpox-Associated Complications: A Systematic Review and Meta-Analysis [Internet]. SSRN; 2025. <https://doi.org/10.2139/ssrn.5378135>.
 42. Gupta AK, Talukder M, Rosen T, Piguet V. Differential Diagnosis, Prevention, and Treatment of mpox (Monkeypox): A Review for Dermatologists. *Am J Clin Dermatol*. 2023;24(4):541–56. <https://doi.org/10.1007/s40257-023-00778-4>.
 43. World Health Organization. Atlas of mpox lesions: a tool for clinical researchers, 28 April 2023, version 1.0 2024. <https://iris.who.int/handle/10665/366569> (CC BY-NC-SA 3.0 IGO licence).
 44. World Health Organization. Infographic: Poster Differential diagnosis mpox lesions. 2024. [mpox-lesions-differential-diagnosis_18.11.2024-v2_poster.pdf](https://iris.who.int/handle/10665/366569) (accessed 27 August 2026).
 45. World Health Organization. Guidelines for diagnosing, preventing and managing cryptococcal disease among adults, adolescents and children living with HIV. 2022 <https://iris.who.int/handle/10665/360423>.
 46. Brosius I, Vakaniaki EH, Mukari G, Munganga P, Tshomba JC, De Vos E, et al. Epidemiological and clinical features of mpox during the clade Ib outbreak in South Kivu, Democratic Republic of the Congo: a prospective cohort study. *The Lancet*. 2025;405(10478):547–59. [https://doi.org/10.1016/S0140-6736\(25\)00047-9](https://doi.org/10.1016/S0140-6736(25)00047-9).
 47. Hughes CM, Liu L, Davidson WB, Radford KW, Wilkins K, Monroe B, et al. A Tale of Two Viruses: Coinfections of Monkeypox and Varicella Zoster Virus in the Democratic Republic of Congo. *The American Journal of Tropical Medicine and Hygiene*. 2021;104(2):604–11. <https://doi.org/10.4269/ajtmh.20-0589>.
 48. Hoff NA, Morier DS, Kisalu NK, Johnston SC, Doshi RH, Hensley LE, et al. Varicella Coinfection in Patients with Active Monkeypox in the Democratic Republic of the Congo. *EcoHealth*. 2017;14(3):564–74. <https://doi.org/10.1007/s10393-017-1266-5>.
 49. Hughes C, McCollum A, Pukuta E, Karhemere S, Nguete B, Shongo Lushima R, et al. Ocular complications associated with acute monkeypox virus infection, DRC. *International Journal of Infectious Diseases*. 2014;21:276–7. <https://doi.org/10.1016/j.ijid.2014.03.994>.
 50. Li Z, Li XX, Chen Y, Ruan Q, Huang X, Zhu G, et al. Persistence of monkeypox virus DNA in clinical specimens. *Journal of Infection*. 2022;85(6):702–69. <https://doi.org/10.1016/j.jinf.2022.10.013>.
 51. Meschi S, Colavita F, Carletti F, Mazzotta V, Matusali G, Specchiarello E, et al. MPXV DNA kinetics in bloodstream and other body fluids samples. *Sci Rep*. 2024;14(1):13487. <https://doi.org/10.1038/s41598-024-63044-5>.
 52. Kim H, Kwon R, Lee H, Lee SW, Rahmati M, Koyanagi A, et al. Viral load dynamics and shedding kinetics of mpox infection: a systematic review and meta-analysis. *Journal of Travel Medicine*. 2023;30(5):taad111. <https://doi.org/10.1093/jtm/taad111>.
 53. Brosius I, Van Dijck C, Coppens J, Vandenhove L, Bangwen E, Vanroye F, et al. Presymptomatic viral shedding in high-risk mpox contacts: A prospective cohort study. *Journal of Medical Virology*. 2023;95(5):e28769. <https://doi.org/10.1002/jmv.28769>.
 54. Kuehn R, Fox T, Guyatt G, Lutje V, Gould S. Infection prevention and control measures to reduce the transmission of mpox: A systematic review. Chowdhury S, editor. *PLOS Glob Public Health*. 2024;4(1):e0002731. <https://doi.org/10.1371/journal.pgph.0002731>.
 55. Seang S, Burrell S, Todesco E, Leducq V, Monsel G, Le Pluart D, et al. Evidence of human-to-dog transmission of monkeypox virus. *The Lancet*. 2022;400(10353):658–9. [https://doi.org/10.1016/S0140-6736\(22\)01487-8](https://doi.org/10.1016/S0140-6736(22)01487-8).
 56. Islam MdM, Dutta P, Rashid R, Jaffery SS, Islam A, Farag E, et al. Pathogenicity and virulence of monkeypox at the human-animal-ecology interface. *Virulence*. 2023;14(1):2186357. <https://doi.org/10.1080/21505594.2023.2186357>.
 57. World Health Organization. Surveillance, case investigation and contact tracing for mpox: interim guidance, 27 November 2024. <https://doi.org/10.2471/B09169>.
 58. Johnson RF, Dyal J, Ragland DR, Huzella L, Byrum R, Jett C, et al. Comparative Analysis of Monkeypox Virus Infection of Cynomolgus Macaques by the Intravenous or Intrabronchial Inoculation Route. *J Virol*. 2011;85(5):2112–25. <https://doi.org/10.1128/JVI.01931-10>.
 59. Thy M, Peiffer-Smadja N, Mailhe M, Kramer L, Ferré VM, Houhou N, et al. Breakthrough Infections after Postexposure Vaccination against Mpox. *N Engl J Med*. 2022;387(26):2477–9. <https://doi.org/10.1056/NEJMc2211944>.
 60. Mellon G, Rubenstein E, Antoine M, Ferré VM, Gabassi A, Molina JM, et al. Air detection of monkeypox virus in a dedicated outpatient clinic room for monkeypox infection diagnosis.

- Journal of Infection. 2023;86(3):256–308.
<https://doi.org/10.1016/j.jinf.2022.12.025>.
61. Gould S, Atkinson B, Onianwa O, Spencer A, Furneaux J, Grieves J, et al. Air and surface sampling for monkeypox virus in a UK hospital: an observational study. *The Lancet Microbe*. 2022;3(12):e904–11.
[https://doi.org/10.1016/S2666-5247\(22\)00257-9](https://doi.org/10.1016/S2666-5247(22)00257-9).
62. Hoxha A, Kerr SM, Laurenson-Schafer H, Sklenovská N, Mirembe BB, Nezu IH, et al. Mpox in Children and Adolescents during Multicountry Outbreak, 2022–2023. *Emerg Infect Dis*. 2023;29(10).
<https://doi.org/10.3201/eid2910.230516>.
63. Hennessee I, Shelus V, McArdle CE, Wolf M, Schatzman S, Carpenter A, et al. Epidemiologic and Clinical Features of Children and Adolescents Aged <18 Years with Monkeypox — United States, May 17–September 24, 2022. *MMWR Morb Mortal Wkly Rep*. 2022;71(44):1407–11.
<https://doi.org/10.15585/mmwr.mm7144a4>.
64. Aguilera-Alonso D, Alonso-Cadenas JA, Roguera-Sopena M, Lorusso N, Miguel LGS, Calvo C. Monkeypox virus infections in children in Spain during the first months of the 2022 outbreak. *The Lancet Child & Adolescent Health*. 2022;6(11):e22–3.
[https://doi.org/10.1016/S2352-4642\(22\)00250-4](https://doi.org/10.1016/S2352-4642(22)00250-4).
65. Kisalu NK, Mokili JL. Toward Understanding the Outcomes of Monkeypox Infection in Human Pregnancy. *The Journal of Infectious Diseases*. 2017;216(7):795–7.
<https://doi.org/10.1093/infdis/jix342>.
66. World Health Organization. Strategic framework for enhancing prevention and control of mpox: 2024–2027.
<https://iris.who.int/handle/10665/376839> (CC BY-NC-SA 3.0 IGO licence).
67. Salvato RS, Rodrigues Ikeda ML, Barcellos RB, Godinho FM, Sesterheim P, Bitencourt LCB, et al. Possible Occupational Infection of Healthcare Workers with Monkeypox Virus, Brazil. *Emerg Infect Dis*. 2022;28(12).
<https://doi.org/10.3201/eid2812.221343>.
68. Nörz D, Pfefferle S, Brehm TT, Franke G, Grewe I, Knobling B, et al. Evidence of surface contamination in hospital rooms occupied by patients infected with monkeypox, Germany, June 2022. *Eurosurveillance*. 2022;27(26).
<https://doi.org/10.2807/1560-7917.ES.2022.27.26.2200477>.
69. Muller MP, Mishra S, McGeer A, Patel S, Gubbay J, Hasso M, et al. Environmental Testing of Surfaces in the Room of a Patient With Mpox. *Clinical Infectious Diseases*. 2023;76(1):179–81.
<https://doi.org/10.1093/cid/ciac654>.
70. Wood JP, Choi YW, Wendling MQ, Rogers JV, Chappie DJ. Environmental persistence of vaccinia virus on materials. *Lett Appl Microbiol*. 2013;57(5):399–404.
<https://doi.org/10.1111/lam.12126>.
71. Rheinbaben FV, Gebel J, Exner M, Schmidt A. Environmental resistance, disinfection, and sterilization of poxviruses. In: Mercer AA, Schmidt A, Weber O, editors. *Poxviruses*. Basel: Birkhäuser Basel; 2007. p. 397–405.
https://doi.org/10.1007/978-3-7643-7557-7_19.
72. Pfeiffer JA, Collingwood A, Rider LE, Minhaj FS, Matheny AM, Kling C, et al. High-Contact Object and Surface Contamination in a Household of Persons with *Monkeypox Virus* Infection — Utah, June 2022. *MMWR Morb Mortal Wkly Rep*. 2022;71(34):1092–4.
<https://doi.org/10.15585/mmwr.mm7134e1>.
73. Morgan CN, Whitehill F, Doty JB, Schulte J, Matheny A, Stringer J, et al. Environmental Persistence of Monkeypox Virus on Surfaces in Household of Person with Travel-Associated Infection, Dallas, Texas, USA, 2021. *Emerg Infect Dis*. 2022;28(10):1982–9.
<https://doi.org/10.3201/eid2810.221047>.
74. Hemati S, Mohammadi-Moghadam F. A systematic review on environmental perspectives of monkeypox virus. *Reviews on Environmental Health*. 2024;39(2):363–70.
<https://doi.org/10.1515/reveh-2022-0221>.
75. Pan D, Nazareth J, Sze S, Martin CA, Decker J, Fletcher E, et al. Transmission of monkeypox/mpox virus: A narrative review of environmental, viral, host, and population factors in relation to the 2022 international outbreak. *Journal of Medical Virology*. 2023;95(2):e28534.
<https://doi.org/10.1002/jmv.28534>.
76. World Health Organization. 2022 Mpox (Monkeypox) Outbreak: Global Trends. 2023.
https://worldhealthorg.shinyapps.io/mpx_global/ (accessed 27 August 2026).
77. Atkinson B, Gould S, Spencer A, Onianwa O, Furneaux J, Grieves J, et al. Monkeypox virus contamination in an office-based workplace environment. *Journal of Hospital Infection*. 2022;130:141–3.
<https://doi.org/10.1016/j.jhin.2022.08.009>.
78. Vaughan A, Aarons E, Astbury J, Brooks T, Chand M, Flegg P, et al. Human-to-Human Transmission of Monkeypox Virus, United Kingdom, October 2018. *Emerg Infect Dis*. 2020;26(4):782–5.
<https://doi.org/10.3201/eid2604.191164>.
79. Carvalho LB, Casadio LVB, Polly M, Nastri AC, Turdo AC, De Araujo Eliodoro RH, et al. Monkeypox Virus Transmission to Healthcare Worker through Needlestick Injury, Brazil. *Emerg Infect Dis*. 2022;28(11):2334–6.
<https://doi.org/10.3201/eid2811.221323>.
80. Del Río García V, Palacios JG, Morcillo AM, Duran-Pla E, Rodríguez BS, Lorusso N. Monkeypox outbreak in a piercing and tattoo establishment in Spain. *The Lancet Infectious Diseases*. 2022;22(11):1526–8.

- [https://doi.org/10.1016/S1473-3099\(22\)00652-1](https://doi.org/10.1016/S1473-3099(22)00652-1).
81. Ward T, Christie R, Paton R, Cumming F, Overton C. Transmission dynamics of monkeypox in the United Kingdom: contact tracing study. *BMJ*. 2022;379:e073153. <https://doi.org/10.1136/bmj-2022-073153>.
 82. Miura F, Backer JA, Van Rijckevorsel G, Bavalia R, Raven S, Petrignani M, et al. Time Scales of Human Mpox Transmission in The Netherlands. *The Journal of Infectious Diseases*. 2024;229(3):800–4. <https://doi.org/10.1093/infdis/jiad091>.
 83. Brosius I, Van Dijk C, Coppens J, Vandenhove L, Bangwen E, Vanroye F, et al. Presymptomatic viral shedding in high-risk mpox contacts: A prospective cohort study. *Journal of Medical Virology*. 2023;95(5):e28769. <https://doi.org/10.1002/jmv.28769>.
 84. World Health Organization. Considerations for wastewater and environmental surveillance for monkeypox virus: Interim guidance. 2024. <https://doi.org/10.2471/B09178> (CC BY-NC-SA 3.0 IGO licence).
 85. World Health Organization. WHO handbook for guideline development, 2nd edition. 2014. <https://iris.who.int/handle/10665/145714> (CC BY-NC-SA 3.0 IGO licence).
 86. World Health Organization. Technical meeting report – Initiation of antiretroviral therapy in people with HIV and mpox. 2024. https://files.magicapp.org/guideline/7a056634-975d-442c-9871-57d650dd990d/files/TWG_report_HIV_mpox_r817731.pdf (accessed 27 August 2026).
 87. Ali R, Alonga J, Biampata J-L, Kimbozi Basika M, Malijkovic Berry I, Bisento N, et al. Tecovirimat for Clade 1 MPXV Infection in the Democratic Republic of Congo. *The New England journal of medicine* 2025;392 (15) 1484–1496. <https://doi.org/10.1056/NEJMoa2412439>.
 88. National Institutes of Health. A Randomized, Placebo-Controlled, Double Blinded Trial of the Safety and Efficacy of Tecovirimat for the Treatment of Human Mpox Virus Disease. Press release 2024. <https://www.nih.gov/news-events/news-releases/nih-study-finds-tecovirimat-was-safe-did-not-improve-mpox-resolution-or-pain> (accessed 27 August 2026).
 89. Guyatt GH, Oxman AD, Kunz R, Falck-Ytter Y, Vist GE, Liberati A, et al. Going from evidence to recommendations. *BMJ*. 2008;336(7652):1049–51. <https://doi.org/10.1136/bmj.39493.646875.AE>.
 90. Guyatt GH, Oxman AD, Vist GE, Kunz R, Falck-Ytter Y, Alonso-Coello P, et al. GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. *BMJ*. 2008;336(7650):924–6. <https://doi.org/10.1136/bmj.39489.470347.AD>.
 91. Balshem H, Helfand M, Schünemann HJ, Oxman AD, Kunz R, Brozek J, et al. GRADE guidelines: 3. Rating the quality of evidence. *Journal of Clinical Epidemiology*. 2011;64(4):401–6. <https://doi.org/10.1016/j.jclinepi.2010.07.015>.
 92. Guyatt G, Oxman AD, Akl EA, Kunz R, Vist G, Brozek J, et al. GRADE guidelines: 1. Introduction—GRADE evidence profiles and summary of findings tables. *Journal of Clinical Epidemiology*. 2011;64(4):383–94. <https://doi.org/10.1016/j.jclinepi.2010.04.026>.
 93. Andrews JC, Schünemann HJ, Oxman AD, Pottie K, Meerpohl JJ, Coello PA, et al. GRADE guidelines: 15. Going from evidence to recommendation—determinants of a recommendation’s direction and strength. *Journal of Clinical Epidemiology*. 2013;66(7):726–35. <https://doi.org/10.1016/j.jclinepi.2013.02.003>.
 94. Paparini S, Whelan I, Mwendera C, Hayes R, Maatouk I, Lewis R, et al. Prevention of sexual transmission of mpox: a systematic review and qualitative evidence synthesis of approaches. *Infectious Diseases*. 2024;56(8):589–605. <https://doi.org/10.1080/23744235.2024.2364801>.
 95. World Health Organization. WHO/Project ECHO webinar series on mpox. 2025. <https://globalhealthoutbreaks.tghn.org/mpox-webinar-resources/> (accessed 27 August 2026).
 96. World Health Organization. Transmission-based precautions for the prevention and control of infections. 2022. <https://iris.who.int/handle/10665/356853> (CC BY-NC-SA 3.0 IGO licence).
 97. World Health Organization. Standard precautions for the prevention and control of infections: aid memoire. 2022. <https://iris.who.int/handle/10665/356855> (CC BY-NC-SA 3.0 IGO licence).
 98. Varkey B. Principles of Clinical Ethics and Their Application to Practice. *Medical Principles and Practice*. International journal of the Kuwait University, Health Science Center 2021;30(1):17–28. <https://doi.org/10.1159/000509119>.
 99. World Health Organization. Meeting Report Technical Working Group (TWG) meeting on infant feeding and direct contact in Mpox infection. 2024. https://files.magicapp.org/guideline/7a056634-975d-442c-9871-57d650dd990d/files/TWG_report_infant_feeding_mpox_r817816.pdf (accessed 27 August 2026).
 100. World Health Organization. Strengthening the global architecture for health emergency prevention, preparedness, response and resilience. 2023. <https://www.who.int/publications/m/item/strengthening-the-global-architecture-for-health-emergency-prevention-preparedness-response-and-resilience> (accessed 27 August 2026).

101. World Health Organization. Infection prevention and control and water, sanitation and hygiene measures for home care and isolation for mpox in resource-limited settings: interim operational guide. 2025. <https://iris.who.int/items/50e29d7d-e685-408e-b65f-2e2369ee7c6e> (accessed 27 August 2026).
102. Adams V, Song J, Shang J, McDonald M, Dowding D, Ojo M, et al. Infection prevention and control practices in the home environment: Examining enablers and barriers to adherence among home health care nurses. *American Journal of Infection Control*. 2021;49(6):721–6. <https://doi.org/10.1016/j.ajic.2020.10.021>.
103. Brockhaus L, Lötscher C, Labhardt ND. Infection prevention practice in home healthcare: a mixed-method study in two Swiss home healthcare organisations. *BMC Health Serv Res*. 2024;24(1):657. <https://doi.org/10.1186/s12913-024-11111-y>.
104. World Health Organization. Risk communication and community engagement (RCCE) for monkeypox outbreaks: Interim guidance 24 June 2022. <https://iris.who.int/handle/10665/357184> (CC BY-NC-SA 3.0 IGO licence).
105. World Health Organization. Home care for patients with suspected or confirmed COVID-19 and management of their contacts: interim guidance, 12 August 2020. <https://iris.who.int/handle/10665/333782> (CC BY-NC-SA 3.0 IGO licence).
106. MacLeod C, Braun L, Caruso BA, Chase C, Chidziwisano K, Chipungu J, et al. Recommendations for hand hygiene in community settings: a scoping review of current international guidelines. *BMJ Open*. 2023;13(6):e068887. <https://doi.org/10.1136/bmjopen-2022-068887>.
107. World Health Organization. Standard precautions: waste management (OpenWHO). 2022. <https://openwho.org/courses/IPC-WM-EN> (accessed 27 August 2026).
108. Pitol AK, Richards S, Mirindi P, Mahamed HO, Baller A, Hughes GL, et al. Efficacy of Disinfectants for Monkeypox Virus Inactivation on High Touch Surface Materials in Low-Resource Settings. *Environ Sci Technol*. 2024;58(45):19981–9. <https://doi.org/10.1021/acs.est.4c09821>.
109. Butcher W, Ulaeto D. Contact inactivation of orthopoxviruses by household disinfectants. *J Appl Microbiol*. 2005;99(2):279–84. <https://doi.org/10.1111/j.1365-2672.2005.02601.x>.
110. Gerba CP, Kennedy D. Enteric Virus Survival during Household Laundering and Impact of Disinfection with Sodium Hypochlorite. *Appl Environ Microbiol*. 2007;73(14):4425–8. <https://doi.org/10.1128/AEM.00688-07>.
111. Rutala WA, Weber DJ. Uses of inorganic hypochlorite (bleach) in health-care facilities. *Clinical Microbial Rev*. 1997;10(4):597–610. <https://doi.org/10.1128/CMR.10.4.597>.
112. World Health Organization. Infection prevention and control of epidemic- and pandemic- prone acute respiratory infections in health care. 2014. <https://iris.who.int/handle/10665/112656> (CC BY-NC-SA 3.0 IGO licence).
113. World Health Organization. Essential environmental health standards for health care. 2008. <https://iris.who.int/handle/10665/43767> (CC BY-NC-SA 3.0 IGO licence).
114. World Health Organization. Guidelines on core components of infection prevention and control programmes at the national and acute health care facility level. 2020. <https://iris.who.int/handle/10665/251730> (CC BY-NC-SA 3.0 IGO licence).
115. World Health Organization. Minimum requirements for infection prevention and control programmes. 2019. <https://iris.who.int/handle/10665/330080> (CC BY-NC-SA 3.0 IGO licence).
116. World Health Organization. Framework and toolkit for infection prevention and control in outbreak preparedness, readiness and response at the national level. 2021. <https://iris.who.int/handle/10665/345251> (CC BY-NC-SA 3.0 IGO licence).
117. World Health Organization. Framework and toolkit for infection prevention and control in outbreak preparedness, readiness and response at the health care facility level. 2022. <https://iris.who.int/handle/10665/361522> (CC BY-NC-SA 3.0 IGO licence).
118. World Health Organization. WHO guidelines on hand hygiene in health care. 2009. <https://iris.who.int/handle/10665/44102> (CC BY-NC-SA 3.0 IGO licence).
119. Pitol AK, Richards S, Mirindi P, Mahamed HO, Baller A, Hughes GL, et al. Efficacy of Laundry Practices in Eliminating Mpox Virus From Fabrics. *The Journal of Infectious Diseases*. 2025;231(4):e607–14. <https://doi.org/10.1093/infdis/jiae606>.
120. World Health Organization. WHO mpox case definitions. 2024. <https://iris.who.int/handle/10665/376900> (CC BY-NC-SA 3.0 IGO licence).
121. World Health Organization. Clinical care for severe acute respiratory infection: toolkit: COVID 19 adaptation. 2020. <https://iris.who.int/handle/10665/352851> (CC BY-NC-SA 3.0 IGO licence).
122. World Health Organization. Interagency Integrated Triage Tool. 2025. <https://www.who.int/tools/triage> (accessed 27 August 2026).
123. Chua WL, Rusli KDB, Aitken LM. Early warning scores for sepsis identification and prediction

- of in-hospital mortality in adults with sepsis: A systematic review and meta-analysis. *Journal of Clinical Nursing*. 2024;33(6):2005–18. <https://doi.org/10.1111/jocn.17061>.
124. World Health Organization. WHO-ICRC Basic Emergency Care: approach to the acutely ill and injured. 2018. <https://iris.who.int/handle/10665/275635> (CC BY-NC-SA 3.0 IGO licence).
 125. World Health Organization. WHO guideline on the prevention and management of wasting and nutritional oedema (acute malnutrition) in infants and children under 5 years. 2023. <https://iris.who.int/handle/10665/376075> (CC BY-NC-SA 3.0 IGO licence).
 126. Flynn M, Mercer D. *Oxford Handbook of Adult Nursing*. 2nd ed. Oxford University Press; 2018. <https://doi.org/10.1093/med/9780198743477.001.0001>
 127. World Health Organization. Care of skin lesions in mpox infection. 2025. https://cdn.who.int/media/docs/default-source/health-care-readiness/mpox-posters/care-of-skin-lesions-in-mpox-infection_poster.pdf (accessed 27 August 2026).
 128. World Health Organization. Guideline: updates on the management of severe acute malnutrition in infants and children. 2013. <https://iris.who.int/handle/10665/95584> (CC BY-NC-SA 3.0 IGO licence).
 129. World Health Organization. Handbook. IMCI integrated management of childhood illness. 2005. <https://iris.who.int/handle/10665/42939> (CC BY-NC-SA 3.0 IGO licence).
 130. World Health Organization. Diagnostic testing and testing strategies for mpox: Interim guidance. 2024. <https://iris.who.int/handle/10665/379547> (CC BY-NC-SA 3.0 IGO licence).
 131. World Health Organization. Doing what matters in times of stress: an illustrated guide. 2020. <https://iris.who.int/handle/10665/331901> (CC BY-NC-SA 3.0 IGO licence).
 132. World Health Organization. mhGAP Humanitarian intervention Guide (mhGAP-HIG): clinical management of mental, neurological and substance use conditions in humanitarian emergencies. 2015. <https://iris.who.int/handle/10665/162960> (CC BY-NC-SA 3.0 IGO licence).
 133. World Health Organization. mhGAP Intervention Guide – version 2.0. 2019. <https://iris.who.int/handle/10665/250239> (CC BY-NC-SA 3.0 IGO licence).
 134. World Health Organization. Psychological first aid: Guide for field workers. 2011. <https://iris.who.int/handle/10665/44615> (CC BY-NC-SA 3.0 IGO licence).
 135. Inter-Agency Standing Committee (IASC). IASC Guidance on Basic Psychosocial Skills – A Guide for COVID – 19 Responders. 2020. <https://interagencystandingcommittee.org/basic-psychosocial-skills-guide-covid-19-responders> (accessed 27 August 2026).
 136. World Health Organization. Problem Management Plus (PM+): Individual psychological help for adults impaired by distress in communities exposed to adversity. 2018. <https://iris.who.int/handle/10665/375604> (CC BY-NC-SA 3.0 IGO licence).
 137. World Health Organization. Optimized supportive care for Ebola virus disease: clinical management standard operating procedures. 2019. <https://iris.who.int/handle/10665/325000> (CC BY-NC-SA 3.0 IGO licence).
 138. World Health Organization. WHO recommendations on antenatal care for a positive pregnancy experience. 2016. <https://iris.who.int/handle/10665/250796> (CC BY-NC-SA 3.0 IGO licence).
 139. World Health Organization. WHO recommendations on maternal and newborn care for a positive postnatal experience. 2022. <https://iris.who.int/handle/10665/351551> (CC BY-NC-SA 3.0 IGO licence).
 140. World Health Organization. Abortion care guideline. 2022. <https://iris.who.int/handle/10665/349316> (CC BY-NC-SA 3.0 IGO licence).
 141. World Health Organization. Guidelines for the management of symptomatic sexually transmitted infections. 2021. <https://iris.who.int/handle/10665/342523> (CC BY-NC-SA 3.0 IGO licence).
 142. World Health Organization. Consolidated guidelines on HIV prevention, testing, treatment, service delivery and monitoring: recommendations for a public health approach. 2021. <https://iris.who.int/handle/10665/342899> (CC BY-NC-SA 3.0 IGO licence).
 143. Oiwoh SO, Ibekwe PU, Ajani AA, Cole-Adeife OM, Olanrewaju FO, Oripelaye MM, et al. Systemic and Dermatologic Impact of Mpox: An Overview of Guideline-Based Management for Nigerian Healthcare Workers. *Nigerian Medical Journal*. 2023;64(1):4–12. <https://www.ncbi.nlm.nih.gov/pubmed/38887434>.
 144. Prasad S, Galvan Casas C, Strahan AG, Fuller LC, Peebles K, Carugno A, et al. A dermatologic assessment of 101 mpox (monkeypox) cases from 13 countries during the 2022 outbreak: Skin lesion morphology, clinical course, and scarring. *Journal of the American Academy of Dermatology*. 2023;88(5):1066–73. <https://doi.org/10.1016/j.jaad.2022.12.035>.
 145. Bartholomew E, Kosche C, Leslie KS. Mpox infection presenting with morbilliform rash: A case series. *JAAD Case Reports*. 2023;35:98–102. <https://doi.org/10.1016/j.jdcrr.2023.03.001>.

146. Hadiati DR, Hakimi M, Nurdianti DS, Masuzawa Y, Da Silva Lopes K, Ota E. Skin preparation for preventing infection following caesarean section. *Cochrane Pregnancy and Childbirth Group, editor. Cochrane Database of Systematic Reviews*. 2020;2020(6). <https://doi.org/10.1002/14651858.CD007462.pub5>.
147. Barajas-Nava LA, López-Alcalde J, Roqué I Figuls M, Solà I, Bonfill Cosp X. Antibiotic prophylaxis for preventing burn wound infection. *Cochrane Wounds Group, editor. Cochrane Database of Systematic Reviews*. 2013;2013(6). <https://doi.org/10.1002/14651858.CD008738.pub2>.
148. Llor C, Bjerrum L. Antimicrobial resistance: risk associated with antibiotic overuse and initiatives to reduce the problem. *Therapeutic Advances in Drug Safety*. 2014;5(6):229–41. <https://doi.org/10.1177/2042098614554919>.
149. World Health Organization. The WHO AWaRe (Access, Watch, Reserve) antibiotic book. 2022. <https://iris.who.int/handle/10665/365237> (CC BY-NC-SA 3.0 IGO licence).
150. Wang W, Chen W, Liu Y, Siemieniuk RAC, Li L, Martínez JPD, et al. Antibiotics for uncomplicated skin abscesses: systematic review and network meta-analysis. *BMJ Open*. 2018;8(2):e020991. <https://doi.org/10.1136/bmjopen-2017-020991>.
151. World Health Organization. The WHO AWaRe (Access, Watch, Reserve) antibiotic book. 2022. <https://iris.who.int/handle/10665/365237> (CC BY-NC-SA 3.0 IGO licence).
152. World Health Organization. Pocket book of hospital care for children: guidelines for the management of common childhood illnesses. 2013. <https://iris.who.int/handle/10665/81170> (CC BY-NC-SA 3.0 IGO licence).
153. World Health Organization. Clinical tools for cholera treatment facilities. 2025. <https://doi.org/10.2471/B09194> (CC BY-NC-SA 3.0 IGO licence).
154. Semba RD. The Ocular Complications of Smallpox and Smallpox Immunization. *Arch Ophthalmol*. 2003;121(5):715. <https://doi.org/10.1001/archophth.121.5.715>.
155. Cash-Goldwasser S, Labuda SM, McCormick DW, Rao AK, McCollum AM, Petersen BW, et al. Ocular Monkeypox — United States, July–September 2022. *MMWR Morb Mortal Wkly Rep*. 2022;71(42):1343–7. <https://doi.org/10.15585/mmwr.mm7142e1>.
156. World Health Organization. Mpox clinical management poster series : eye involvement. 2025. https://cdn.who.int/media/docs/default-source/integrated-health-services-%28ihs%29/ipc/mpox-poster-series--eye-final_packaged_en.pdf (accessed 27 August 2026).
157. Zinder R, Cooley R, Vlad LG, Molnar JA. Vitamin A and Wound Healing. *Nutrition in Clinical Practice*. 2019;34(6):839–49. <https://doi.org/10.1002/ncp.10420>.
158. Liu SH, Hawkins BS, Ng SM, Ren M, Leslie L, Han G, et al. Topical pharmacologic interventions versus placebo for epidemic keratoconjunctivitis. *Cochrane Eyes and Vision Group, editor. Cochrane Database of Systematic Reviews*. 2022;2022(3). <https://doi.org/10.1002/14651858.CD013520.pub2>.
159. Liu P, Li G, Han M, Cheng X, Cui Y, Md, et al. Efficacy and Safety of Ophthalmic Preparations of Glucocorticoids in Patients with Epidemic Keratoconjunctivitis: A Systematic Review and Meta-analysis. *Therapeutic Innovation and Regulatory Science*. 2023;57(3):476–83. <https://doi.org/10.1007/s43441-022-00479-w>.
160. Wilhelmus KR. Antiviral treatment and other therapeutic interventions for herpes simplex virus epithelial keratitis. *Cochrane Eyes and Vision Group, editor. Cochrane Database of Systematic Reviews*. 2015;2015(1). <https://doi.org/10.1002/14651858.CD002898.pub5>.
161. Cinatl J, Bechtel M, Reus P, Ott M, Rothweiler F, Michaelis M, et al. Trifluridine for treatment of mpox infection in drug combinations in ophthalmic cell models. *Journal of Medical Virology*. 2024;96(1):e29354. <https://doi.org/10.1002/jmv.29354>.
162. World Health Organization. Emergency use of unproven clinical interventions outside clinical trials: ethical considerations. 2025. <https://iris.who.int/handle/10665/352902> (CC BY-NC-SA 3.0 IGO licence).
163. World Health Organization. Consolidated guidelines on differentiated HIV testing services. 2024. <https://doi.org/10.2471/B09074> (CC BY-NC-SA 3.0 IGO licence).
164. Anekar AA, Hendrix JM, Cascella M. World Health Organization Analgesic Ladder. 2025. <https://pubmed.ncbi.nlm.nih.gov/32119322> (CC BY-NC-SA 3.0 IGO licence).
165. World Health Organization. Mpox clinical management poster series: pain management. 2025. <https://www.who.int/publications/m/item/supplementary-information-for-mpox-clinical-management-poster-series--pain-management> (accessed 27 August 2026).
166. Nigeria Center for Disease Control. National monkeypox public health response guidelines. 2019. Nigeria Centre for Disease Control; 2019. https://ncdc.gov.ng/themes/common/docs/protocols/96_1577798337.pdf (accessed 27 August 2026)..
167. France K, Villa A. Acute Oral Lesions. *Dermatologic Clinics*. 2020;38(4):441–50. <https://doi.org/10.1016/j.det.2020.05.005>.

168. World Health Organization. Care of skin lesions in mpox infection. 2025. https://cdn.who.int/media/docs/default-source/health-care-readiness/mpox-posters/care-of-skin-lesions-in-mpox-infection_poster.pdf (accessed 27 August 2026).
169. Busse JW, Sadeghirad B, Oparin Y, Chen E, Goshua A, May C, et al. Management of Acute Pain From Non-Low Back, Musculoskeletal Injuries: A Systematic Review and Network Meta-analysis of Randomized Trials. *Ann Intern Med*. 2020;173(9):730–8. <https://doi.org/10.7326/M19-3601>.
170. Busse JW, Wang L, Kamaleldin M, Craigie S, Riva JJ, Montoya L, et al. Opioids for Chronic Noncancer Pain: A Systematic Review and Meta-analysis. *JAMA*. 2018;320(23):2448. <https://doi.org/10.1001/jama.2018.18472>.
171. Olejnik L, Lima JP, Sadeghirad B, Busse JW, Florez ID, Ali S, et al. Pharmacologic Management of Acute Pain in Children: A Systematic Review and Network Meta-Analysis. *JAMA Pediatr*. 2025;179(4):407. <https://doi.org/10.1001/jamapediatrics.2024.5920>.
172. World Health Organization. Mpox clinical management poster series: fluid management. 2025. <https://www.who.int/publications/m/item/supplementary-information-for-mpox-clinical-management-poster-series--fluid-management> (accessed 27 August 2026).
173. Reynolds M, McCollum A, Nguete B, Shongo Lushima R, Petersen B. Improving the Care and Treatment of Monkeypox Patients in Low-Resource Settings: Applying Evidence from Contemporary Biomedical and Smallpox Biodefense Research. *Viruses*. 2017;9(12):380. <https://doi.org/10.3390/v9120380>.
174. D'Antonio F, Pagani G, Buca D, Khalil A. Monkeypox infection in pregnancy: a systematic review and metaanalysis. *American Journal of Obstetrics & Gynecology MFM*. 2023;5(1):100747. <https://doi.org/10.1016/j.ajogmf.2022.100747>.
175. Hobson G, Adamson J, Adler H, Firth R, Gould S, Houlihan C, et al. Family cluster of three cases of monkeypox imported from Nigeria to the United Kingdom, May 2021. *Eurosurveillance*. 2021;26(32). <https://doi.org/10.2807/1560-7917.ES.2021.26.32.2100745>.
176. Mbala PK, Huggins JW, Riu-Rovira T, Ahuka SM, Mulembakani P, Rimoin AW, et al. Maternal and Fetal Outcomes Among Pregnant Women With Human Monkeypox Infection in the Democratic Republic of Congo. *The Journal of Infectious Diseases*. 2017;216(7):824–8. <https://doi.org/10.1093/infdis/jix260>.
177. Brown SH, Goldfarb IT, Shenoy ES, Kwolek D. Mpox exposure in pregnancy. *Journal of General Internal Medicine* 2023. <https://doi.org/10.1007/s11606-023-08226-z>.
178. Nachega JB, Mohr EL, Dashraath P, Mbala-Kingebeni P, Anderson JR, Myer L, et al. Mpox in Pregnancy — Risks, Vertical Transmission, Prevention, and Treatment. *N Engl J Med*. 2024;391(14):1267–70. <https://doi.org/10.1056/NEJMp2410045>.
179. Jamieson DJ, Jernigan DB, Ellis JE, Treadwell TA. Emerging Infections and Pregnancy: West Nile Virus, Monkeypox, Severe Acute Respiratory Syndrome, and Bioterrorism. *Clinics in Perinatology*. 2005;32(3):765–76. <https://doi.org/10.1016/j.clp.2005.04.008>.
180. World Health Organization. WHO recommendations on intrapartum care for a positive childbirth experience. 2018. <https://iris.who.int/handle/10665/260178> (CC BY-NC-SA 3.0 IGO licence).
181. World Health Organization. WHO recommendations: Induction of labour at or beyond term. 2018. <https://iris.who.int/handle/10665/277233> (CC BY-NC-SA 3.0 IGO licence).
182. World Health Organization. WHO recommendations on Postnatal care of mother and newborn. 2013. <https://iris.who.int/handle/10665/97603> (CC BY-NC-SA 3.0 IGO licence).
183. World Health Organization. Guidelines on optimal feeding of low birth-weight infants in low-and middle-income countries. 2011. <https://iris.who.int/handle/10665/85670> (CC BY-NC-SA 3.0 IGO licence).
184. Clark AE, Furst A, Sejane K, Stellwagen L, Proost M, Pride D, et al. Validating Tools to Detect and Inactivate Monkeypox Virus in Human Milk. *Breastfeeding Medicine*. 2023;18(10):785–9. <https://doi.org/10.1089/bfm.2023.0175>.
185. World Health Organization. The WHO Global Clinical Platform for mpox. 2026. <https://www.who.int/tools/global-clinical-platform/monkeypox> (accessed 27 August 2026).
186. World Health Organization. Clinical characterization of mpox including monitoring the use of therapeutic interventions: Statistical plan. 2023. <https://iris.who.int/handle/10665/373366> (CC BY-NC-SA 3.0 IGO licence).
187. World Health Organization. Mpox screening tool for health workers. 2025. <https://cdn.who.int/media/docs/default-source/health-care-readiness/mpox-posters/mpox-screening-tool-for-health-workers-poster.pdf> (accessed 27 August 2026).
188. World Health Organization. Mpox triage and clinical assessment for suspected and confirmed cases. 2024. <https://cdn.who.int/media/docs/default-source/health-care-readiness/mpox->

- posters/mpox-triage-and-clinical-assessment-for-suspected-and-confirmed-cases_18.11.2024-v3_poster.pdf (accessed 27 August 2026).
189. World Health Organization. Mpox lesions differential diagnosis. 2024. https://cdn.who.int/media/docs/default-source/health-care-readiness/mpox-posters/mpox-lesions-differential-diagnosis_18.11.2024-v2_poster.pdf (accessed 27 August 2026)..
 190. World Health Organization. Interim practical manual for designing, setting up and assessing health facilities in the context of mpox outbreaks. 2024. <https://iris.who.int/handle/10665/380532> (CC BY-NC-SA 3.0 IGO licence).
 191. World Health Organization. Infection prevention and control in the context of coronavirus disease (COVID-19): a living guideline. 2023. <https://iris.who.int/handle/10665/373269> (CC BY-NC-SA 3.0 IGO licence).
 192. World Health Organization. Natural ventilation for infection control in health care settings. 2009. <https://iris.who.int/handle/10665/44167> (CC BY-NC-SA 3.0 IGO licence).
 193. World Health Organization. Global technical consultation report on proposed terminology for pathogens that transmit through the air. 2024. <https://iris.who.int/handle/10665/376496> (CC BY-NC-SA 3.0 IGO licence).
 194. International Labour Organization. International Standard Classification of Occupation (ISCO-08). 2016. <https://www.ilo.org/publications/international-standard-classification-occupations-2008-isco-08-structure> (accessed 27 August 2026).
 195. World Health Organization. Health workforce-related terminology. 2021. <https://cdn.who.int/media/docs/default-source/health-workforce/hwp/202100608-health-workforce-terminology.pdf> (accessed 27 August 2026).
 196. World Health Organization. Natural ventilation for infection control in health-care settings. 204. 2009. <https://iris.who.int/handle/10665/44167> (CC BY-NC-SA 3.0 IGO licence).
 197. World Health Organization. Technical specifications of personal protective equipment for COVID-19. 2020. <https://iris.who.int/handle/10665/336622>. (CC BY-NC-SA 3.0 IGO licence).
 198. World Health Organization. The world health report: 2006: working together for health. 2006. <https://iris.who.int/handle/10665/43432> (CC BY-NC-SA 3.0 IGO licence).
 199. U.S Department of Health and Human Services. What is the difference between isolation and quarantine? 2022. <https://www.hhs.gov/answers/public-health-and-safety/what-is-the-difference-between-isolation-and-quarantine/index.html> (accessed 27 August 2026).
 200. World Health Organization. Operational considerations for case management of COVID-19 in health facility and community: Interim guidance. 2020. <https://iris.who.int/handle/10665/331492> (CC BY-NC-SA 3.0 IGO licence).
 201. OpenWHO. Clinical management of patients with COVID-19: Initial approach to the acutely ill patient. 2021. https://openwho.org/playlist/dedicated/500316/0_xfe055ah/0_0ik7wg69 (accessed 27 August 2026).
 202. Masirika LM, Udaheureka JC, Ndishimye P, Martinez GS, Kelvin P, Nadine MB, et al. Epidemiology, clinical characteristics, and transmission patterns of a novel Mpox (Monkeypox) outbreak in eastern Democratic Republic of the Congo (DRC): *an observational, cross-sectional cohort study* [Internet]. Epidemiology; 2024. <https://doi.org/10.1101/2024.03.05.24303395>.
 203. O’Laughlin K, Tobolowsky FA, Elmor R, Overton R, O’Connor SM, Damon IK, et al. Clinical Use of Tecovirimat (Tpoxx) for Treatment of Monkeypox Under an Investigational New Drug Protocol — United States, May–August 2022. MMWR Morb Mortal Wkly Rep. 2022;71(37):1190–5. <https://doi.org/10.15585/mmwr.mm7137e1>.

Annex 1: Definitions and terminology

Aerosol-generating procedures: Medical procedures that are reported to be aerosol generating are consistently associated with an increased risk of pathogen transmission. The current list of procedures recognized by WHO as aerosol generating includes aspiration or open suctioning of respiratory tract specimens, bronchoscopy, intubation, cardiopulmonary resuscitation, manual ventilation before intubation, sputum induction by using nebulized hypertonic saline, dentistry and autopsy procedures [\[112\]](#)[\[191\]](#).

Airborne infection isolation room: A room with a high ventilation rate and controlled direction of airflow that can be used to contain airborne infections and acute respiratory infections caused by a novel agent with the potential to pose a public health risk. Such rooms can be naturally or mechanically ventilated [\[112\]](#).

Naturally ventilated airborne precaution room: the airflow should be directed to areas free of transit, or should permit the rapid dilution of contaminated air into the surrounding areas and the open air; the average ventilation rate should be 160 L/s per patient [\[192\]](#).

Mechanically ventilated airborne precaution room: negative pressure is created to control the direction of airflow; the ventilation rate should be at least 12 air changes per hour (ACH). Such a room is equivalent to the “airborne infection isolation room” described by the United States Centers for Disease Control and Prevention.

Airborne transmission/inhalation (formerly airborne transmission): Occurs when infectious respiratory particles (IRPs) are expelled into the air and enter, through inhalation, the respiratory tract of another person. This form of transmission can occur when the IRPs have travelled either short or long distances from the infectious person. The portal of entry of an IRP into respiratory tract tissue during airborne transmission can theoretically occur at any point along the human respiratory tract, but preferred sites of entry may be pathogen specific. It should be noted that the distance travelled will depend on multiple factors including particle size, mode of expulsion and environmental conditions (such as airflow, humidity, temperature, setting, ventilation, etc.) [\[193\]](#).

Care workers: People who provide direct personal care services in the home, in a health care or residential setting, assisting with routine tasks of daily life and performing other tasks of a simple and routine nature. This term comprises [\[194\]](#)[\[195\]](#):

Health care assistants: institution-based, personal care workers who provide direct personal care and assistance with activities of daily living to patients and residents in a variety of health care settings, such as hospitals, clinics and residential nursing care facilities. They generally implement established care plans and practices under the direct supervision of medical, nursing or other health professionals or associate professionals.

Home-based personal care workers: provide routine personal care and assistance with activities of daily living to persons who are in need of such care due to effects of ageing, illness, injury or other physical or mental conditions, in private homes and other independent residential settings.

Case definitions: Refer to WHO guidance on mpox case definitions [\[120\]](#).

Contact transmission: The spread of an infectious agent caused by physical contact of a susceptible host with people or objects [96].

Direct contact transmission involves both a direct body-surface-to-body-surface contact and physical transfer of microorganisms between an infected or colonized person and a susceptible host [112][96]. In addition, direct contact transmission can occur when an infectious person directly transfers infectious pathogens from their own respiratory tract, not via IRPs, to another person by being in direct contact with that person (e.g. via a handshake), who then directly transfers the IRPs into their own mouth, nose or eyes [193].

Indirect contact transmission involves contact of a susceptible host with a contaminated intermediate object (e.g. contaminated hands) that carries and transfers the microorganisms [112][96]. Contaminated surfaces are also created when IRPs expelled into the air settle on a surface, or when an infected person transfers infectious respiratory secretions by first touching their own mouth, nose or eyes and then touching a surface or shaking hands. Infectious pathogens on the contaminated surfaces are then transferred to another person who touches that contaminated surface and then their own mouth, nose or eyes [193].

Direct deposition (formerly droplet transmission): Occurs when IRPs are expelled into the air following a short-range semi-ballistic trajectory, then are directly deposited on the exposed facial mucosal surfaces (mouth, nose or eyes) of another person, thus, entering the human respiratory tract via these portals and potentially causing infection [193].

Filtering facepiece respirator (FFR or respirator): Filtering facepiece respirators (FFRs or respirators) offer a balance of filtration, breathability and fit. Whereas medical masks filter 3-micrometre droplets, N95-rated and FFP2-rated FFRs must filter more challenging 0.075-micrometre particles or particulates and must do so across the entire surface of the respirator as a result of the fitted design. European FFP2 FFRs, according to the EN 149 standard, filter at least 94% sodium chloride (NaCl) salt particles and paraffin oil droplets. The United States of America's N95 FFRs, according to the National Institute for Occupational Safety and Health NIOSH 42 CFR Part 84, filter at least 95% NaCl salt particles [196][197].

Health worker: Health and care workers are all people from the community to hospitals, primarily engaged in actions with the primary intent of enhancing health. This includes health service providers, such as doctors, nursing and midwifery professionals, public health professionals, technicians (laboratory, health, medical and non-medical), personal care workers, and healers and practitioners of traditional medicine. It also includes health management and support workers, such as cleaners, drivers, hospital administrators, district health managers, social workers and other occupational groups in health-related activities [198][195]. This document uses the combined term of health and care worker to cover all roles and settings.

Infectious respiratory particles: Pathogens, contained within a particle (known as “infectious particles”), that travel through the air and these infectious particles are carried by expired airflow which enter the human respiratory tract or are deposited on the mucosa of the mouth, nose or eye of another person [193].

Isolation: The separation of infected people with a contagious disease from people who are not infected [199].

Screening: A process through which an individual is evaluated to see whether that person meets a standardized case definition. Screening does not typically require close physical contact or clinical expertise [200][201].

Standard precautions: Aim to protect both health workers and patients by reducing the risk of transmission of microorganisms from both recognized and unrecognized sources. They are the minimum standard of IPC practices that should be used by all health and care workers, during the care of all patients, at all times, in all settings. When applied consistently, standard precautions can prevent the transmission of microorganisms between patients, health workers and the environment [97].

Transmission-based precautions: Transmission-based precautions are used in addition to standard precautions for patients with known or suspected infection or colonization with transmissible and/or epidemiologically significant pathogens. The type of transmission-based precautions assigned to a patient depends on the transmission route of the microorganism: contact, droplet or airborne [96].

Triage: The process of sorting patients into categories based on the need for time-sensitive treatment using validated tools. Triage identifies those who require immediate medical intervention, and those who can safely wait. Triage may occur at a health post, primary health centre, clinic or emergency unit. It typically requires close physical contact (within 1 m) with the patient during the assessment [200][201].

Annex 2. Medications and dosages for symptomatic care

Antihistaminic for itching

- Adults: Loratadine 10 mg PO once daily.
- Children (> 30 kg): Loratadine 10 mg PO once daily.

Nausea and vomiting

Ondansetron (associated with QT prolongation, thus it is important to note other medications that may also prolong the QT interval and to monitor regularly with ECGs if available).

- Adults: 8 mg PO every 12 hours or 4 mg IV every 8 hours as needed.
- Children: 0.15 mg/kg orally or IV 0.15 mg/kg every 12 hours, maximum dose 8 mg.

Promethazine

- Only for adults: 12.5–25 mg orally every 4–6 hours as needed (can prolong QT interval).

Dyspepsia

- **Adult:** *Omeprazole 40 mg PO/IV every 24 hours.*
- **Child:** Omeprazole: 5–10 kg: 5 mg once daily; 10–20 kg: 10 mg once daily; ≥ 20 kg: 20 mg once daily.

Diarrhoea

Diarrhoea should be managed conservatively. The use of anti-motility agents is not generally recommended given the potential for ileus.

Anxiety

This may be a symptom patients experience particularly related to being in isolation or due to worsening symptoms.

- First-line therapy is to talk with a mental health counsellor.
- For moderate to severe anxiety, diazepam can be considered, but an evaluation of the patient's mental status should precede its use.

Benzodiazepines should not be given to patients with altered mentation.

- **Adults:** Diazepam 5–10 mg PO every 8 hours as needed as long as mentation is unaffected.
- **Children:** Diazepam 0.05–0.1 mg/kg PO every 6 hours as needed.

Continual supervision by a health aid is indicated to keep the child calm. Sedatives should only be used if necessary to perform procedures and give interventions.

Agitation

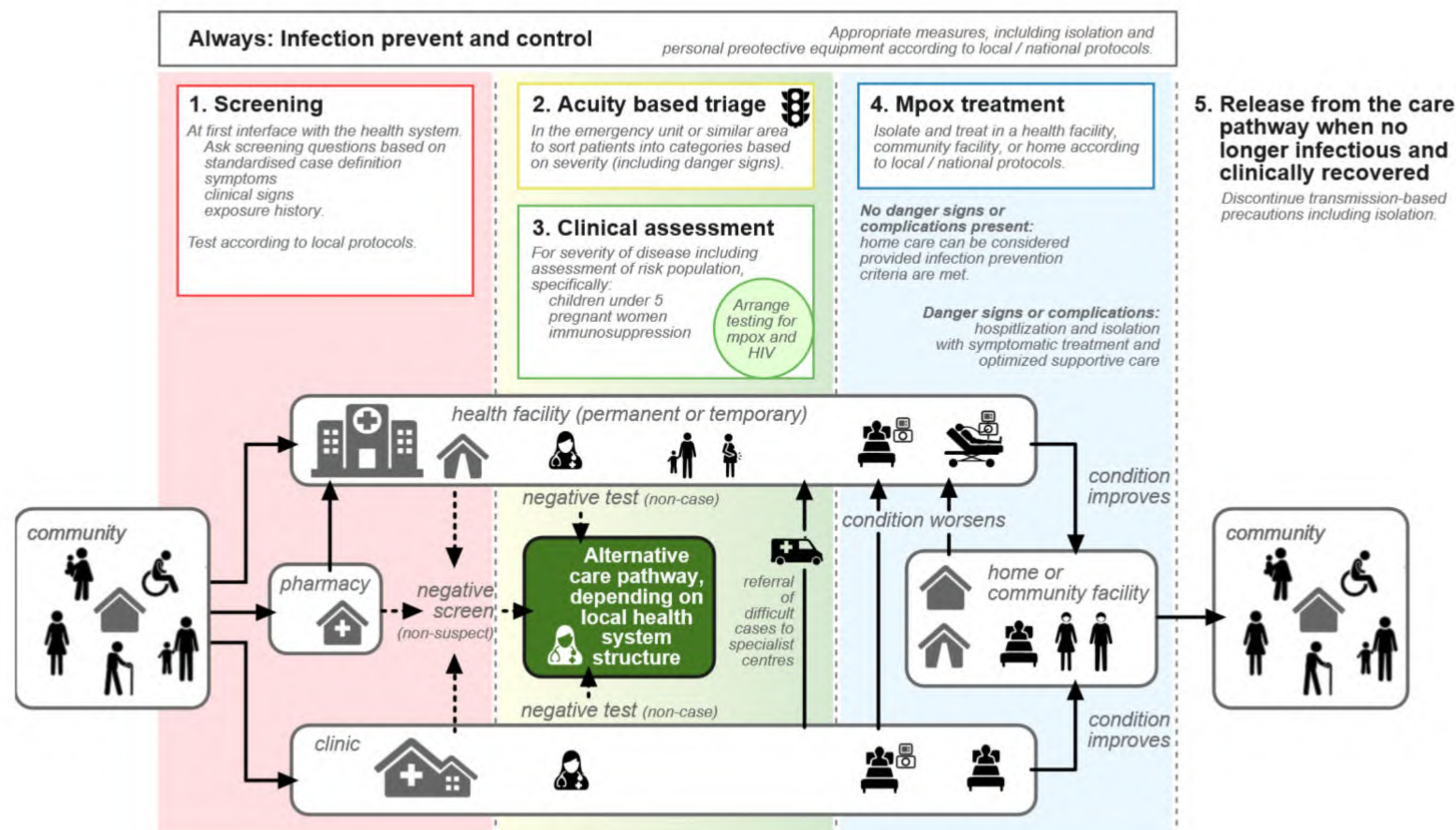
If patient is agitated and becomes a danger to self, health care providers or other patients, consider pharmacotherapy.

- **Adults:**
 - Diazepam 2–10 mg PO/IV every 6–8 hours as needed as long as patient can protect their airway.
 - Haloperidol 0.5–5 mg every 4–6 hours, as needed.
- **Children > 6 years:** Haloperidol IM 1–3 mg every 4–8 hours, as needed.
- **Children 3–6 years:** Haloperidol PO 0.01–0.03 mg/kg once daily.

Haloperidol is associated with QT prolongation, thus it is important to note other medications that may also prolong the QT interval and to monitor with ECG regularly if available.

Note: Avoid the use of salicylates (e.g. aspirin) in children and adolescents < 18 years of age to avoid the development of Reye's Syndrome.

Annex 3. Mpox care pathway



Relevant guidance is available in this guideline, and in:

- WHO Basic Emergency Care guidelines [124].
- Infection prevention and control and water, sanitation and hygiene measures for community health workers supporting mpox outbreaks in resource limited settings: a summary [101].

Annex 4. Search strategy and terminology for reported routes of MPXV infection

A commissioned systematic review in 2024 underpins the current guideline and is an update of a previously published review. It synthesized and updated evidence for the three research questions. The review occurred in two stages. The first stage appraised available evidence from comparative interventional trials, which yielded no evidence. In the absence of such data, the second stage was performed to synthesize evidence on the reported routes of MPXV infection using non-comparative study designs to indirectly inform the three IPC intervention review questions.

Literature search strategy

The search was done at the end of September 2024 using broad search terms including terms for mpox-like viruses. The search included the following databases: MEDLINE (OVID), Embase (OVID), Biosis previews (Web of Science), CAB Abstracts (Web of Science) and Global Index Medicus.

Inclusion and exclusion criteria

All studies published in English and French between September 2022 and September 2024 that presented data on the mpox mode of transmission were eligible to be included. Both comparative and non-comparative studies in different settings (health care, households, communal living/community settings) were included. The following mpox studies were excluded; studies without transmission data, studies solely concerning animal-to-animal or animal-to-human transmission, studies solely examining laboratory transmission, non-original studies, and studies that published in a language other than English and French.

Given the potential for varying interpretations of key terminology, the following descriptions were used for the purpose of the systematic review:

- i. Fully healed: mpox lesions have crusted, scabs have fallen off and a fresh layer of skin has formed underneath.
- ii. Infectious period: until mpox lesions have crusted, scabs have fallen off and a fresh layer of skin has formed underneath.
- iii. Isolation: the separation of infected people with a contagious disease from people who are not infected by keeping to a separate room or area within the home.
- iv. Adequate ventilation in a single patient room: may be achieved by mechanical, natural or hybrid ventilation.
 - a. Mechanical ventilation rate: six air changes per hour in room.

- b. Natural ventilation rate: 60 L/sec per patient.
- c. Hybrid (mixed mode) ventilation is a combination of both mechanical and natural ventilation. It relies on natural driving forces to provide the desired (design) flow rate. Mechanical ventilation can be used when the natural ventilation flow rate is too low.
- v. Airborne isolation room ventilation: mechanical ventilation to meet criteria for an airborne precaution room: negative pressure is created to control the direction of airflow. The ventilation rate should be at least 12 air changes per hour.

Natural ventilation to meet criteria for an airborne precaution room: the airflow should be directed to areas free of transit or should permit the rapid dilution of contaminated air into the surrounding areas and the open air. The average ventilation rate should be 160 L/sec per patient.

From the data collected from stage two, several subgroup analyses were conducted based on different contexts:

1. Setting
 - a. Review considered: household, communal living, or health care settings community settings.
2. Clade (where known or presumed)
 - a. The analysis included Clade I, Clade II, and its subtypes Clade IIa and Clade IIb (and all sub lineages, including but not limited to IIb lineage A, IIb lineage B, and IIb lineage C).
3. Route of transmission
 - a. Transmission routes were analysed based on the information detailed in the paper(s).
4. Region and/or country
 - a. Data were categorized by WHO regions, including the African Region, Region of the Americas, South-East Asia Region, European Region, Eastern Mediterranean Region and Western Pacific Region.
5. Context

Cases reported in the global mpox outbreak since 2022, categorized as the West African clade, were classified as likely Clade IIb unless evidence emerged to the contrary.

The review conducted in 2024 followed a similar search strategy as the one in 2023, the main difference being the extended timeframe.

Annex 5. Systematic monitoring of patients

Vital signs and pain assessment	• Temperature, heart rate, blood pressure, respiratory rate, peripheral oxygen saturation, level of consciousness using the alert, voice, pain, unresponsive scale (AVPU), point of care glucose, and body weight and height to calculate BMI and children's mid-upper arm circumference (MUAC) • Pain scale
General condition	• Is the patient able to eat and drink without support? • Is the patient able to sit and walk independently? • Has the patient had recent weight loss since onset of symptoms?
Rash characterization	• Stage of rash: macules, papules, vesicles, pustules, crusted over, exfoliation • Location of the rash (face, arms, torso, genitals, legs, mucosa) • Number of lesions – Mild (< 25 skin lesions) – Moderate (25–99 skin lesions) – Severe (100–250 skin lesions) – Very severe (> 250 skin lesions) • If exfoliation present: % body affected (> 10% is concerning)
Presence of bacterial secondary infection	Signs of cellulitis, abscess, pyomyositis, necrotizing soft tissue infection
Neurologic status	• AVPU, seizures, coma
Volume status	Presence of dehydration: mild, moderate or severe
Signs of perfusion	• Pulse rate, strength, capillary refill • Urine output (> 0.5 mL/kg/h = good in adults; 1.0 mL/kg/h in children) • Mottling of skin
Respiratory system	Respiratory rate, SpO ₂ , signs of respiratory distress
Nutritional assessment	• Change in appetite, weight loss, body weight, height, calculation of BMI, MUAC in children • Signs of malnutrition – use standardized tool (e.g. Malnutrition Universal Screening Tool)
Ophthalmological examination	One of the most frequent complications, for early diagnosis and management
Laboratory tests	Haematology: white blood count, haemoglobin, platelet. Biochemistry: urea, creatinine, ALT, ASTe, glucose, albumin. Electrolytes: sodium, potassium, bicarbonate, calcium, chloride. Coagulation: prothrombin time/INR.

Vital signs and clinical features to monitor systematically (Source: This table is modified from the WHO Optimized supportive care for Ebola virus disease [137] and includes information from the WHO Pocket book of hospital care for children [152]).

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Annex 7. Rates and predictors of severe disease

A systematic review was conducted up to September 2024 [\[41\]](#) (data mostly from the 2022 global outbreak) to understand prognosis, complications and risk factors. The search strategy returned 3606 results; after the screening, 130 studies (19 for risk factors) were included, including 89 722 patients with a male percentage ranging from 42.9% to 100% and a median age range of 6.9 to 43 years. Data were mostly limited to clade 2b, and were very limited for children and pregnant women.

Methods

To provide the GDG with a comprehensive understanding of mpox prognosis, a systematic review of observational studies published up to 20 September 2024, was conducted. The review aimed to: 1) establish baseline risk estimations for clinical adverse outcomes, including but not limited to hospitalization and mortality, in patients with mpox, differentiating between severe and non-severe cases as defined in the literature; and 2) identify adjusted risk factors associated with mpox prognosis [\[41\]](#).

With assistance from an expert librarian, the review team searched MEDLINE, Embase, CENTRAL, CINAHL, Global Health, medRxiv, bioRxiv, and SSRN from inception to September 2024, using search terms including "mpox", "cohort", "case-control", "observational study", "cross-sectional", "epidemiologic", "population surveillance", "retrospective", "prospective" and "randomized controlled trial". To identify additional eligible studies, the review team screened the reference lists of included studies and relevant systematic reviews. The review included studies of patients with laboratory-confirmed mpox virus infections that reported the rate of clinical adverse outcomes and adjusted risk factors for adverse outcomes.

To estimate pooled baseline risks and their associated 95% confidence intervals for each adverse outcome, the review team conducted meta-analyses of proportions using fixed effects models. The review team performed analyses for all patients, severe patients and non-severe patients separately. For every candidate risk factor, as most eligible studies reported odds ratios (OR) as the measure of association, if studies reported relative risks (RRs) or hazard ratios (HRs), the review team converted them to ORs and pooled ORs using the random effects model.

The review team examined different thresholds to classify studies as reporting on severe disease or non-severe disease and decided on a 50% threshold to categorize studies as severe disease or non-severe disease. Studies with fewer than 50% of participants classified as having severe mpox or hospitalized for treatment were categorized as non-severe; studies with 50% or more were categorized as severe.

Rates of adverse outcomes

Data from the September 2024 systematic review [41] are presented in Table A7.1 which shows the baseline risk estimates for adverse outcomes. In the non-severe cohort, the rate of hospitalization is 4% (39 to 42) with very low mortality. Whereas, in patients from the severe cohort, already hospitalized, the rate of death is estimated to be 4.6% (36 to 58).

Table A7.1 Baseline risk for adverse outcomes in patients with mpox

Outcomes	Event rate (95% CI per 1000)		
	Non-severe cohort*	Severe cohort*	Overall
Hospitalization	40 per 1000 (39 to 42)	NA	42 per 1000 (40 to 43)
ICU admission	0.3 per 1000 (0.1 to 0.7)	49 per 1000 (33 to 68)	0.4 per 1000 (0.1 to 0.9)
Mechanical ventilation	8 per 1000 (1 to 19)	55 per 1000 (34 to 80)	26 per 1000 (16 to 39)
All-cause mortality	0 per 1000 (0 to <0.001)	46 per 1000 (36 to 58)	0 per 1000 (0 to <0.001)

* The review team used a 50% threshold to categorize studies as severe or non-severe. Studies with fewer than 50% of participants classified as having severe mpox or hospitalized for treatment were categorized as non-severe; studies with 50% or more were categorized as severe.

Risk factors

Using data from the systematic review [41], the GDG agreed that a risk factor was useful for if the odds ratio (OR) was 2.0 or more, and if there was at least a moderate certainty of evidence. Additional, but less useful risk factors were identified by a moderate certainty of evidence and an OR of between 1.7 and 2.0. Those with a low or very low certainty of evidence or an OR of less than 1.7 were not considered useful.

Major risk factors for severe disease or hospitalization amongst patients with non-severe mpox are HIV, and HIV with CD4 < 350 cells/mm3 (see Table A7.2 for full details).

HIV was the only major risk factor identified for death (see Table A7.3 for full details).

Table A7.2 Risk factors associated with severe disease or hospitalization

Risk factors	Study results and measurements	Certainty of the evidence (Quality of evidence)	Summary
Age (per 10 years increase)	Odds ratio: 0.88 (95% CI 0.63 to 1.23) Based on data from 16 939 participants in 6 studies	Low Due to serious inconsistency, Due to serious imprecision	Age may be associated with little or no increase in severe disease.
Sex (males vs females)	Odds ratio: 0.78 (95% CI 0.34 to 1.78) Based on data from 5501 participants in 3 studies	Low Due to serious inconsistency; Due to serious imprecision	Males may be associated with little or no increase in severe disease compared with females.

HIV (positive vs negative)	Odds ratio: 1.79 (95% CI 1.07 to 3.00) Based on data from 9883 participants in 7 studies	Moderate Due to serious inconsistency	HIV is probably associated with increased odds of severe disease.
HIV (CD4 < 350 cells/mm ³ vs HIV negative)	Odds ratio: 2.45 (95% CI 1.19 to 5.02) Based on data from 2321 participants in 2 studies	High	Patients with CD4 < 350 cells/mm ³ are associated with increased odds of severe disease compared with HIV negative patients.
HIV (CD4 ≥ 350 cells/mm ³ vs HIV negative)	Odds ratio: 0.82 (95% CI 0.55 to 1.22) Based on data from 2321 participants in 2 studies	Low Due to serious inconsistency; Due to serious imprecision	Patients with CD4 ≥ 350 cells/mm ³ may be associated with little or no increase in severe disease compared with HIV negative patients.
Vaccination (mpox or smallpox)	Odds ratio: 0.88 (95% CI 0.57 to 1.36) Based on data from 7400 participants in 7 studies	Low Due to serious inconsistency; Due to serious imprecision	Mpox or smallpox vaccination may be associated with little or no decrease in severe disease.
Vaccination (childhood or prior smallpox)	Odds ratio: 0.96 (95% CI 0.61 to 1.51) Based on data from 7032 participants in 6 studies	Low Due to serious inconsistency; Due to serious imprecision	Childhood or prior smallpox vaccination may be associated with little or no decrease in severe disease.

Table A7.3 Risk factors associated with mortality

Risk factors	Study results and measurements	Certainty of the evidence (Quality of evidence)	Summary
HIV (positive vs negative)	Odds ratio: 10.81 (95% CI 9.80 to 11.92) Based on data from 3377 participants in 2 studies	High	HIV is associated with increased odds of all-cause mortality.
Age (per year)	Odds ratio: 0.90 (95% CI 0.82 to 0.97) Based on data from 86 participants in 1 study	Very low Due to extremely serious imprecision	We are uncertain whether age is associated with increased odds of all-cause mortality.
Sex (males vs females)	Odds ratio: 3.59 (95% CI 0.54 to 23.60) Based on data from 86 participants in 1 study	Very low Due to extremely serious imprecision	We are uncertain whether males are associated with increased odds of all-cause mortality compared with females.

Risk for adverse outcomes

Table A7.4 shows the baseline risk estimates from the systematic review. In the non-severe cohort the rate of hospitalization is 4% (39 to 42) with very low mortality. Whereas, in patients from the severe cohort, already hospitalized, the rate of death is estimated to be 4.6% (36 to 58).

Table A7.4Baseline risk for adverse outcomes in patients with mpox

Outcomes	Event rate (95% CI per 1000)		
	Non-severe cohort*	Severe cohort*	Overall
Hospitalization	40 per 1000 (39 to 42)	NA	42 per 1000 (40 to 43)
ICU admission	0.3 per 1000 (0.1 to 0.7)	49 per 1000 (33 to 68)	0.4 per 1000 (0.1 to 0.9)
Mechanical ventilation	8 per 1000 (1 to 19)	55 per 1000 (34 to 80)	26 per 1000 (16 to 39)
All-cause mortality	0 per 1000 (0 to < 0.001)	46 per 1000 (36 to 58)	0 per 1000 (0 to < 0.001)

* The review team used a 50% threshold to categorize studies as severe or non-severe. Studies with fewer than 50% of participants classified as having severe mpox or hospitalized for treatment were categorized as non-severe; studies with 50% or more were categorized as severe.

Annex 8. Rapid systematic search for packages of care for mpox

A rapid systematic search for packages of care in mpox was used to identifying potential interventions to improve patient outcomes.

Problem

- There is no effective antiviral for mpox.
- Patients want to receive the best care, which is complex to provide and based on multiple medical approaches which must be selected and targeted to a patient's needs.
- There are large numbers of interventions from which to select, typically delivered as a package:
 - many of the items are “best medical practice” and unlikely to have direct or high certainty evidence;
 - there are likely to be many interactions between interventions in terms of trade-offs of time/resource/focus, which considering individual PICO does not capture; and
 - the overall package may describe “high value” interventions, or a systematic description of potential interventions.

Strategy

Identify packages of care which may be used as interventions to reduce mpox mortality and morbidity.

Initial proposed PICO

In patients who require hospitalization for mpox disease, does a structured set of interventions compared with usual care improve morbidity and/or mortality?

Methods

Rapid search limited to published literature.

Databases

- MEDLINE (searched via PubMed)
- EMBASE
- CINAHL (EBSCO)
- Clinical trials registries
 - Clinicaltrials.gov
 - ISTRP
 - Pan African Clinical Trials Registry (PACTR)

Inclusion criteria (require all of...)

- interventions described in sufficient clinical detail to be implementable
- intervention or prospective observational studies or guideline implementation description
- published in full, or published in abstract with prior registration of the study on an international database
- reporting at least one outcome in abstract or full text from: death; serious adverse events; hospital admission; hospital length of stay; pregnancy outcome; disease transmission

Exclusion criteria (any of...)

- case reports, or case series with <10 patients
- retrospective studies
- studies of vaccination or vaccine-based immunity
- studies of testing strategies or diagnostic test performance
- non-human studies
- interventions applied before patients reach a healthcare professional

Limits

- No language filters

Search terms (Pubmed)

Search date 12/03/2025

#	Query	Search Details	Results
13	#11 AND #12	("mpox, monkeypox"[MeSH Terms] OR ("mpox"[All Fields] AND "monkeypox"[All Fields]) OR "monkeypox mpox"[All Fields] OR "mpox"[All Fields] OR "mpox, monkeypox"[MeSH Terms] OR ("mpox, monkeypox"[MeSH Terms] OR ("mpox"[All Fields] AND "monkeypox"[All Fields]) OR "monkeypox mpox"[All Fields] OR "monkeypox"[All Fields])) AND ("intervention"[All Fields] OR "outcome"[All Fields] OR ("mortality"[MeSH Terms] OR "mortality"[All Fields] OR "mortalities"[All Fields] OR "mortality"[MeSH Subheading] OR ("death"[MeSH Terms] OR "death"[All Fields] OR "deaths"[All Fields]) OR "hospitali*ation"[All Fields] OR "complication"[All Fields])	1,321
12	#4 OR #6 OR #7 OR #8 OR #9 OR #10	"intervention"[All Fields] OR "outcome"[All Fields] OR "mortality"[MeSH Terms] OR "mortality"[All Fields] OR "mortalities"[All Fields] OR "mortality"[MeSH Subheading] OR "death"[MeSH Terms] OR "death"[All Fields] OR "deaths"[All Fields] OR "hospitali*ation"[All Fields] OR "complication"[All Fields]	8,903,461
11	#1 OR #2 OR #3	"mpox, monkeypox"[MeSH Terms] OR ("mpox"[All Fields] AND "monkeypox"[All Fields]) OR "monkeypox mpox"[All Fields] OR "mpox"[All Fields] OR "mpox, monkeypox"[MeSH Terms] OR ("mpox, monkeypox"[MeSH Terms] OR ("mpox"[All Fields] AND "monkeypox"[All Fields]) OR "monkeypox mpox"[All Fields] OR "monkeypox"[All Fields])	5,951
10	complication*	"complication"[All Fields]	3,741,841
9	hospitali*ation	"hospitali*ation"[All Fields]	312,514
8	death	"death"[MeSH Terms] OR "death"[All Fields] OR "deaths"[All Fields]	1,309,081

7	mortality	"mortality"[MeSH Terms] OR "mortality"[All Fields] OR "mortalities"[All Fields] OR "mortality"[MeSH Subheading]	1,670,116
6	outcome*	"outcome*"[All Fields]	3,636,872
4	intervention*	"intervention*"[All Fields]	1,720,945
3	monkeypox	"mpox, monkeypox"[MeSH Terms] OR ("mpox"[All Fields] AND "monkeypox"[All Fields]) OR "monkeypox mpox"[All Fields] OR "monkeypox"[All Fields]	5,412
2	mpox[Mesh]	"mpox, monkeypox"[MeSH Terms]	3,418
1	mpox	"mpox, monkeypox"[MeSH Terms] OR ("mpox"[All Fields] AND "monkeypox"[All Fields]) OR "monkeypox mpox"[All Fields] OR "mpox"[All Fields]	4,379

Search terms (Embase)

('mpox' OR 'monkeypox'/exp OR 'monkeypox') AND ('intervention*' OR 'outcome*' OR 'mortality'/exp OR 'mortality' OR 'death*' OR 'hospitali*ation' OR 'complication*')

Found 2071 results (1032 not in Pubmed after de-duplication which were screened)

Search terms (Clinical trials databases)

Search “mpox”, excluding those not yet recruiting, or recruiting.

Clinicaltrials.gov

Search date 13/03/2025

- n=21 for full review, 20 not relevant.

Found 1 study: NCT05559099 (PALM007)

International Clinical Trials Registry Platform (ICTRP)

Search date 13/03/2025, limiting to phase 2 and 3 trials.

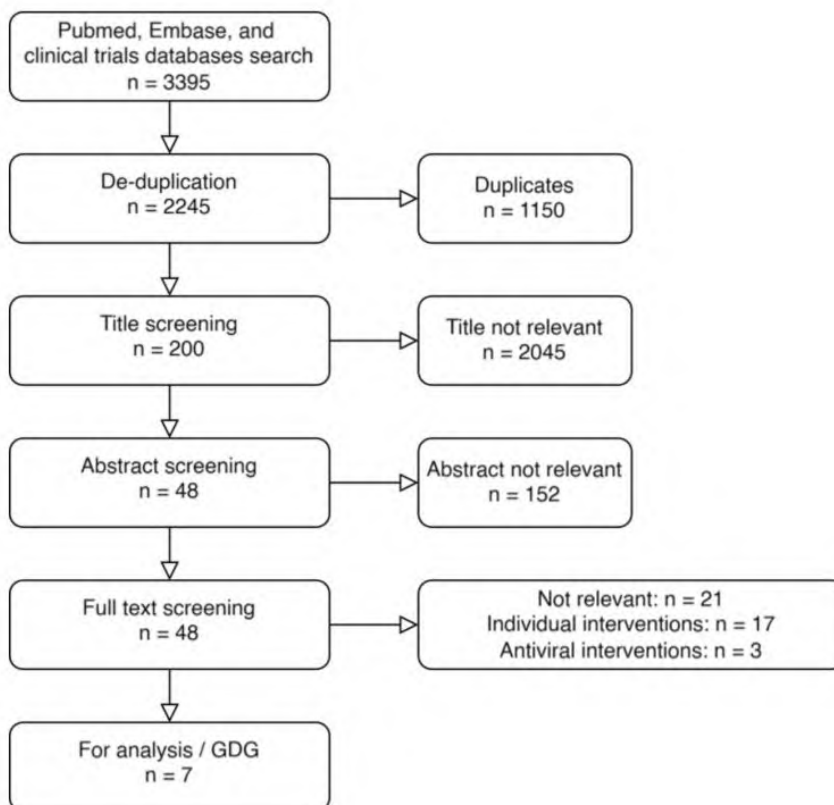
- n=51
- Found 1 study: NCT05559099 (PALM007)

Pan African Clinical Trials Registry (PACTR)

Search date 13/03/2025

- n=3 for full review
- Found 1 study which is ongoing, but not reported: PACTR202405860723287 “A phase III, multi-country, randomized, placebo-controlled, double-blinded adaptive platform trial to assess the efficacy and safety of treatments for participants with monkeypox virus disease”

Flowchart of search results



Seven articles were identified for analysis (see below). Of these, in-depth review demonstrated only one (PALM 007) had sufficient published descriptions of multiple interventions, how they were implemented, and patient outcomes.

Identified articles for analysis

- Jiang RM, Zheng YJ, Zhou L, Feng LZ, Ma L, Xu BP et al. Diagnosis, treatment, and prevention of monkeypox in children: an experts' consensus statement. *World J Pediatr.* 2023;19(3):231-42 (<https://www.doi.org/10.1007/s12519-022-00624-3>).
- Jiang R, Zheng Y, Zhou L, et al. Expert consensus on the diagnosis, treatment and prevention of monkeypox in children. *Chinese Journal of Applied Clinical Pediatrics.* 2022;37(13):964-73 (<http://dx.doi.org/10.3760/cma.j.cn101070-20220627-00779>).
- PALM 007 study. A randomized, placebo-controlled, double-blinded trial of the safety and efficacy of tecovirimat for the treatment of adult and pediatric patients with monkeypox virus disease. United States National Library of Medicines. 2025 (<https://clinicaltrials.gov/study/NCT05559099>).
- Pittman PR, Martin JW, Kingebeni PM, Muyembe Tamfum JJ, Wan Q, Reynolds MG et al. Clinical characterization of human monkeypox infections in the Democratic Republic of the Congo. *medRxiv.* 2022 (<http://dx.doi.org/10.1101/2022.05.26.22273379>).
- Reynolds MG, McCollum AM, Nguete B, Shongo Lushima R, Petersen BW. Improving the care and treatment of monkeypox patients in low-resource settings: applying evidence from

contemporary biomedical and smallpox biodefense research. *Viruses*. 2017;9(12):380 (<https://doi.org/10.3390/v91200380>).

- STOMP study. A randomized, placebo-controlled, double-blinded trial of the safety and efficacy of tecovirimat for the treatment of human mpox virus disease. United States National Library of Medicines. 2025 (<https://clinicaltrials.gov/study/NCT05534984>).
- Zeyen C, Kinberger M, Kriedemann H, Pfäfflin F, Tober-Lau P, Huang L et al. Clinical spectrum and long-term outcomes of mpox: a cohort study spanning from acute infection to six-month follow-up. *BMC Infect Dis*. 2024. 24(1):317 (<https://doi.org/10.1186/s12879-024-09191-6>).

Annex 9. Declarations of interest

The technical unit collected and managed written statements of declaration of interest (DOI) from all the participants in the meeting held in Nairobi, Kenya 9–13 June 2025. Conflicts of interest were declared by three participants related to funding for research support in the area of mpox but they were not deemed grounds for participation eligibility. During the meeting, the technical unit described the DOI process to the expert participants and no verbal conflicts were declared or discovered. No participant was removed from the list as the conflicts of interest declared did not influence the elaboration of the guidelines and their objectivity and quality.

Table A9.1 below you can see the identification of the conflict of interests of the participants and the analysis and conclusion regarding the conflicts of interest declared by participants

Participant	Declaration of interest	Description	Conclusion
Oshiozimedede Quincy Aigbonoga	No conflict		
Agnes Bangura	No conflict		
Jean-Luc Biampata	No conflict		
Lucille Hellen Blumberg	No conflict		
Rose-Carole Bohimbo	No conflict		
Ian Crozier	No conflict		
Prince Imani Musimwa	No conflict		
Darlinda Jiba	No conflict		
Patricia Kabuni Mukuetala	No conflict		
Patrick Chanda Kabwe	No conflict		
Richard Kojan	No conflict		
Hans-Joerg Lang	No conflict		
Kieron Leslie	No conflict		
Laurens Liesenborghs	No conflict		
Dally Kambaji Muamba	No conflict		
Jean-Claude Mwanza	No conflict		
Grace Ndeezi	No conflict		
Liliane Nkengurutse	No conflict		
Gabriel Okorie Maduwuike	No conflict		
Joseph Oliver-Commey	No conflict		
Chizaram Onyeaghala	No conflict		
Sebastine Oseghae Oiwoh	Yes	Research support for National (Nigeria) mpox agenda as expert with Nigeria CDC in collaboration with FHI360 (260 000 Naira) in 2024.	Not a significant conflict of interest.
Judith Kose Otieno	No conflict		

Steven Yeh	No conflict		
Paul Msanzya Zulu	No conflict		
Jason Zucker	Yes	Research support with NIH and CDC (CDC completed, NIH support for STOMP ongoing). Support (US\$1500 on two occasions 2023 and 2024) for being on a speakers' bureau, giving speeches or training for IAS-USA related to mpox.	Not a significant conflict of interest.
Nadia Jaqueline Mandeng	Yes	Consulting for CDC/USA Global consultant on mpox (currently ceased).	Not a significant conflict of interest.

PICO tables

Mpox patient isolated until all lesions are fully healed [Intervention] vs Mpox patient does not isolate when all non-healed lesions are covered and wears a medical mask [Comparator]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary
		Isolation until lesions fully healed	Covered lesions, medical mask, no isolation		
Non-poolable outcomes	Mpox infection inferred from transmission route frequency data		31 742 reported cases of transmission as a result of close contact in 32 318 patients (210/222 studies). This can be disaggregated further as: 21 025 cases due to confirmed sexual contact; 9788 cases due to suspected sexual contact; and 930 due to non-sexual close contact. Inferred odds: 1	Low risk of bias: Serious indirectness: Serious	Isolating patients probably does not prevent transmission of mpox compared with not isolating patient provided all lesions are covered, a medical mask is worn and physical contact with others is avoided.

Mpox patient isolated until all lesions are fully healed [Intervention] vs Mpox patient does not isolate when all non-healed lesions are covered and wears a medical mask [Comparator]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary
		Isolation until lesions fully healed	Covered lesions, medical mask, no isolation		
Non-poolable outcomes	Mpox infection inferred from transmission route frequency data		31 742 reported cases of transmission as a result of close contact in 32 318 patients (210/222 studies). This can be disaggregated further as: 21 025 cases due to confirmed sexual contact; 9788 cases due to suspected sexual contact; and 930 due to non-sexual close contact. Inferred odds: 1	Low risk of bias: Serious indirectness: Serious	Isolating patients probably does not prevent transmission of mpox compared with not isolating patient provided all lesions are covered, a medical mask is worn and physical contact with others is avoided.

Medical masks as a part of contact and droplet precautions [Intervention] vs Respirators in addition to contact and droplet precautions [Comparator]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary	
		Medical masks as a part of contact and droplet precautions	Respirators in addition to contact and droplet precautions			
Non-poolable outcomes	Mpox infection inferred from transmission route frequency data		1 reported case of transmission by droplet in 32318 patients (1/270 studies) Inferred odds ratio: 1		Low risk of bias: Serious indirectness: Serious	The use of a respirator probably makes little to no difference in preventing mpox transmission compared to a medical mask

Medical masks as a part of contact and droplet precautions [Intervention] vs Respirators in addition to contact and droplet precautions [Comparator]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary
		Medical masks as a part of contact and droplet precautions	Respirators in addition to contact and droplet precautions		
Non-poolable outcomes	Mpox infection inferred from transmission route frequency data		1 reported case of transmission by droplet in 32318 patients (1/270 studies) Inferred odds ratio: 1	Low risk of bias: Serious indirectness: Serious	The use of a respirator probably makes little to no difference in preventing mpox transmission compared to a medical mask

Chlorhexidine gluconate [Intervention] vs Povidine iodine [Comparator]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary
		Chlorhexidine gluconate	Povidine iodine		
Dichotomous outcomes					
Skin irritation or allergic skin reaction	Relative risk: 0.64 (CI95: 0.28 — 1.46) Data from 1296 participants in 3 studies	10.0 per 1000 Difference: 5.0 fewer (95%CI: 11.0 fewer to 7.0 more)	15.0 per 1000	Very low risk of bias: Serious indirectness: Very serious	We are very uncertain about the effect of Chlorhexidine gluconate versus Povidine iodine on adverse events

Topical antibiotic therapy [Intervention] vs Care without the use of antibiotic therapy [Comparator]

Patients with mpox and extensive skin lesions or exfoliation, but no clinical signs of bacterial cellulitis or secondary bacterial infection [Population]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary	
		Antibiotic therapy (oral/ topical)	Care without the use of antibiotic therapy			
Dichotomous outcomes						
Skin infection	Odds ratio: 0.75 (CI95: 0.32 — 1.73) Data from 99 participants in 2 studies	71.0 per 1000 Difference: 21.0 fewer (95%CI: 61.0 fewer to 57.0 more)	92.0 per 1000	Very low risk of bias: Serious indirectness: Serious imprecision: Serious	We are very uncertain whether topical antibiotics reduce skin infections as compared to control/ placebo	
Continuous outcomes						
	Length of stay (topical antibiotics versus SOC/ placebo)	(Measured by: [Lowbetter]) Data from 33 participants in 1 study	16.3 days (mean)	18 days (mean)	Very low risk of bias: Serious indirectness: Serious imprecision: Serious	We are very uncertain whether topical antibiotics reduce length of hospital stay as compared to soc/ placebo
mean difference: -1.65fewer mean						

Systemic antibiotic therapy [Intervention] vs Care without the use of antibiotic therapy [Comparator]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary
		Oral antibiotic therapy	Care without the use of antibiotic therapy		
Dichotomous outcomes					
Skin infection	Relative risk: 0.64 (CI95: 0.07 — 6.09) Data from 79 participants in 2 studies	59.0 per 1000 Difference: 33.0 fewer (95%CI: 86.0 fewer to 468.0 more)	92.0 per 1000	Very low risk of bias: Serious indirectness: Serious imprecision: Serious	We are very uncertain whether topical antibiotics reduce skin infection rates as compared to SOC/ placebo
Mortality	Relative risk: 0.41 (CI95: 0.17 — 1.02) Data from 119 participants in 2 studies	19.0 per 1000 Difference: 27.0 fewer (95%CI: 38.0 fewer to 1.0 more)	46.0 per 1000	Very low risk of bias: Serious indirectness: Serious imprecision: Serious	We are very uncertain whether topical antibiotics reduce skin infection rates as compared to SOC/ placebo
Continuous outcomes					
Length of stay		(Measured by: [Lowbetter]) Data from 51 participants in 1 study	18.8 (mean)	18 (mean)	Very low risk of bias: Serious indirectness: Serious imprecision: Serious
mean difference: 0.8more mean					We are very uncertain whether systemic antibiotics reduce length of hospital stay as compared to SOC/ placebo

Antibiotic therapy [Intervention] vs no antibiotic therapy [Comparator]

Patients who have undergone surgical drainage for uncomplicated cutaneous abscess [Population]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary
		antibiotic therapy	no antibiotic therapy		
Dichotomous outcomes					
Treatment failure within 1 month	Odds ratio: 0.58 (CI95: 0.37 — 0.9) Data from 2517 participants in 8 studies	56.0 per 1000 Difference: 37.0 fewer (95%CI: 56.0 fewer to 9.0 fewer)	93.0 per 1000	Very low risk of bias: Serious inconsistency: Serious imprecision: Serious	We are very uncertain whether antibiotics reduce treatment failure within one month as compared to no antibiotics
Recurrence within 1 month	Odds ratio: 0.48 (CI95: 0.3 — 0.77) Data from 2134 participants in 6 studies	66.0 per 1000 Difference: 63.0 fewer (95%CI: 86.0 fewer to 27.0 fewer)	129.0 per 1000	Low risk of bias: Serious indirectness: Serious	Antibiotics may reduce recurrence within one month as compared to no antibiotics
Hospitalisations within one month	Odds ratio: 0.55 (CI95: 0.32 — 0.94) Data from 1206 participants in 2 studies	22.0 per 1000 Difference: 17.0 fewer (95%CI: 26.0 fewer to 2.0 fewer)	39.0 per 1000	Low indirectness: Serious imprecision: Serious	Antibiotics may reduce hospitalisations within three month as compared to no antibiotics
Pain within 3-4 days	Odds ratio: 0.76 (CI95: 0.6 — 0.97) Data from 1057 participants in 1 study	491.0 per 1000 Difference: 68.0 fewer (95%CI: 127.0 fewer to 8.0 fewer)	559.0 per 1000	Low indirectness: Serious imprecision: Serious	Antibiotics may reduce pain compared to no antibiotics
Additional surgical procedures within 1-3 months	Odds ratio: 0.58 (CI95: 0.39 — 0.87) Data from 1013 participants in 1 study	79.0 per 1000 Difference: 50.0 fewer (95%CI: 74.0 fewer to 15.0 fewer)	129.0 per 1000	Low indirectness: Serious imprecision: Serious	Antibiotics may reduce requirement for additional surgical procedures as compared to no antibiotics
Infections in family members within one month	Odds ratio: 0.58 (CI95: 0.34 — 1.01)	40.0 per 1000 Difference: 27.0 fewer (95%CI: 43.0 fewer to 1.0 more)	67.0 per 1000	Low indirectness: Serious imprecision: Serious	Antibiotics may reduce infections in family members as compared to no antibiotics
Adverse events	Odds ratio: 1.04 (CI95: 1.02 — 1.07) Data from 20345 participants in 65 studies	199.0 per 1000		Moderate indirectness: Serious	Antibiotics used in hospital are probably associated with adverse events
Antimicrobial resistance in inpatient antibiotic use	Odds ratio: 1.03 (CI95: 0.98 — 1.07) Data from 2330 participants	106.0 per 1000		Low indirectness: Serious imprecision: Serious	Antibiotics used in hospital may be associated with antimicrobial resistance

in 9 studies

Topical Trifluridine [Intervention] vs Artificial tears [Comparator]

Mpox patients with eye pain and/ or redness [Population]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary	
		Topical Trifluridine	No Trifluridine			
Continuous outcomes	Resolution of symptoms within 7 days (steroids versus artificial tears)	(Measured by: [Lowbetter]) Data from 49 participants in 1 study	11 (mean)	11 (mean)	Very low risk of bias: Serious indirectness: Serious imprecision: Serious	We are very uncertain about the effect of Trifluridine versus artificial tears on resolution of symptoms within 7 days
mean difference: 0.00fewer mean						

Topical corticosteroids [Intervention] vs Supportive care [Comparator]

Mpox patients with eye pain and/ or redness [Population]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary	
		Topical corticosteroids	Supportive care			
Dichotomous outcomes						
Resolution of symptoms within 7 days (steroids versus artificial tears)	Relative risk: 1.0 (CI95: 0.07 — 15.15) Data from 52 participants in 1 study	38.0 per 1000 Difference: 0.0 fewer (95%CI: 35.0 fewer to 538.0 more)	38.0 per 1000	Very low risk of bias: Serious indirectness: Serious imprecision: Serious	We are very uncertain about the effect of steroids versus artificial tears on proportion of participants attaining resolution of symptoms within 7 days	
Continuous outcomes						
mean difference: 1fewer mean	Days to symptom resolution (steroids versus artificial tears)	(Measured by: [Lowbetter])	10 (mean)	11 (mean)	Very low risk of bias: Serious indirectness: Serious imprecision: Serious	We are very uncertain about the effect of steroids versus artificial tears on days to symptom resolution

Topical antibiotic therapy [Intervention] vs Care without the use of antibiotic therapy [Comparator]

Patients with mpox and extensive skin lesions or exfoliation, but no clinical signs of bacterial cellulitis or secondary bacterial infection [Population]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary	
		Antibiotic therapy (oral/ topical)	Care without the use of antibiotic therapy			
Dichotomous outcomes						
Skin infection	Odds ratio: 0.75 (CI95: 0.32 — 1.73) Data from 99 participants in 2 studies	71.0 per 1000 Difference: 21.0 fewer (95%CI: 61.0 fewer to 57.0 more)	92.0 per 1000	Very low risk of bias: Serious indirectness: Serious imprecision: Serious	We are very uncertain whether topical antibiotics reduce skin infections as compared to control/ placebo	
Continuous outcomes						
Length of stay (topical antibiotics versus SOC/ placebo) mean difference: -1.65fewer mean		(Measured by: [Lowbetter]) Data from 33 participants in 1 study	16.3 days (mean)	18 days (mean)	Very low risk of bias: Serious indirectness: Serious imprecision: Serious	We are very uncertain whether topical antibiotics reduce length of hospital stay as compared to soc/ placebo

Systemic antibiotic therapy [Intervention] vs Care without the use of antibiotic therapy [Comparator]

Patients with mpox and extensive skin lesions or exfoliation, but no clinical signs of bacterial cellulitis or secondary bacterial infection [Population]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary
		Oral antibiotic therapy	Care without the use of antibiotic therapy		
Dichotomous outcomes					
Skin infection	Relative risk: 0.64 (CI95: 0.07 — 6.09) Data from 79 participants in 2 studies	59.0 per 1000 Difference: 33.0 fewer (95%CI: 86.0 fewer to 468.0 more)	92.0 per 1000	Very low risk of bias: Serious indirectness: Serious imprecision: Serious	We are very uncertain whether topical antibiotics reduce skin infection rates as compared to SOC/ placebo
Mortality	Relative risk: 0.41 (CI95: 0.17 — 1.02) Data from 119 participants in 2 studies	19.0 per 1000 Difference: 27.0 fewer (95%CI: 38.0 fewer to 1.0 more)	46.0 per 1000	Very low risk of bias: Serious indirectness: Serious imprecision: Serious	We are very uncertain whether topical antibiotics reduce skin infection rates as compared to SOC/ placebo
Continuous outcomes					
Length of stay		(Measured by: [Lowbetter])	18.8 (mean)	18 (mean)	Very low risk of bias: Serious indirectness: Serious imprecision: Serious
mean difference: 0.8more mean		Data from 51 participants in 1 study			We are very uncertain whether systemic antibiotics reduce length of hospital stay as compared to SOC/ placebo

Antibiotic therapy [Intervention] vs no antibiotic therapy [Comparator]

Patients who have undergone surgical drainage for uncomplicated cutaneous abscess [Population]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary
		antibiotic therapy	no antibiotic therapy		
Dichotomous outcomes					
Treatment failure within 1 month	Odds ratio: 0.58 (CI95: 0.37 — 0.9) Data from 2517 participants in 8 studies	56.0 per 1000 Difference: 37.0 fewer (95%CI: 56.0 fewer to 9.0 fewer)	93.0 per 1000	Very low risk of bias: Serious inconsistency: Serious imprecision: Serious	We are very uncertain whether antibiotics reduce treatment failure within one month as compared to no antibiotics
Recurrence within 1 month	Odds ratio: 0.48 (CI95: 0.3 — 0.77) Data from 2134 participants in 6 studies	66.0 per 1000 Difference: 63.0 fewer (95%CI: 86.0 fewer to 27.0 fewer)	129.0 per 1000	Low risk of bias: Serious indirectness: Serious	Antibiotics may reduce recurrence within one month as compared to no antibiotics
Hospitalisations within one month	Odds ratio: 0.55 (CI95: 0.32 — 0.94) Data from 1206 participants in 2 studies	22.0 per 1000 Difference: 17.0 fewer (95%CI: 26.0 fewer to 2.0 fewer)	39.0 per 1000	Low indirectness: Serious imprecision: Serious	Antibiotics may reduce hospitalisations within three month as compared to no antibiotics
Pain within 3-4 days	Odds ratio: 0.76 (CI95: 0.6 — 0.97) Data from 1057 participants in 1 study	491.0 per 1000 Difference: 68.0 fewer (95%CI: 127.0 fewer to 8.0 fewer)	559.0 per 1000	Low indirectness: Serious imprecision: Serious	Antibiotics may reduce pain compared to no antibiotics
Additional surgical procedures within 1-3 months	Odds ratio: 0.58 (CI95: 0.39 — 0.87) Data from 1013 participants in 1 study	79.0 per 1000 Difference: 50.0 fewer (95%CI: 74.0 fewer to 15.0 fewer)	129.0 per 1000	Low indirectness: Serious imprecision: Serious	Antibiotics may reduce requirement for additional surgical procedures as compared to no antibiotics
Infections in family members within one month	Odds ratio: 0.58 (CI95: 0.34 — 1.01)	40.0 per 1000 Difference: 27.0 fewer (95%CI: 43.0 fewer to 1.0 more)	67.0 per 1000	Low indirectness: Serious imprecision: Serious	Antibiotics may reduce infections in family members as compared to no antibiotics
Adverse events	Odds ratio: 1.04 (CI95: 1.02 — 1.07)	199.0 per 1000		Moderate indirectness: Serious	Antibiotics used in hospital are probably associated with

Antimicrobial resistance in inpatient antibiotic use	Data from 20345 participants in 65 studies Odds ratio: 1.03 (CI95: 0.98 — 1.07) Data from 2330 participants in 9 studies	106.0 per 1000	Low indirectness: Serious imprecision: Serious	adverse events Antibiotics used in hospital may be associated with antimicrobial resistance
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Topical corticosteroids [Intervention] vs Supportive care [Comparator]

Mpox patients with eye pain and/ or redness [Population]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary	
		Topical corticosteroids	Supportive care			
Dichotomous outcomes						
Resolution of symptoms within 7 days (steroids versus artificial tears)	Relative risk: 1.0 (CI95: 0.07 — 15.15) Data from 52 participants in 1 study	38.0 per 1000 Difference: 0.0 fewer (95%CI: 35.0 fewer to 538.0 more)	38.0 per 1000	Very low risk of bias: Serious indirectness: Serious imprecision: Serious	We are very uncertain about the effect of steroids versus artificial tears on proportion of participants attaining resolution of symptoms within 7 days	
Continuous outcomes						
	Days to symptom resolution (steroids versus artificial tears)	(Measured by: [Lowbetter])	10 (mean)	11 (mean)	Very low risk of bias: Serious indirectness: Serious imprecision: Serious	We are very uncertain about the effect of steroids versus artificial tears on days to symptom resolution
mean difference: 1fewer mean						

Topical Trifluridine [Intervention] vs Artificial tears [Comparator]

Mpox patients with eye pain and/ or redness [Population]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary	
		Topical Trifluridine	No Trifluridine			
Continuous outcomes	Resolution of symptoms within 7 days (steroids versus artificial tears)	(Measured by: [Lowbetter])	11 (mean)	11 (mean)	Very low risk of bias: Serious indirectness: Serious imprecision: Serious	We are very uncertain about the effect of Trifluridine versus artificial tears on resolution of symptoms within 7 days
mean difference: 0.00fewer mean		Data from 49 participants in 1 study				

Delayed ART [Intervention] vs Early ART [Comparator]

HIV with Mpox [Population]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary
		Delayed ART	Early ART		
Dichotomous outcomes					
Mortality (high risk)	Odds ratio: 2.08 (CI95: 1.08 — 3.99) Data from 7418 participants in 3 studies	91.0 per 1000 Difference: 45.0 more (95%CI: 3.0 more to 115.0 more)	46.0 per 1000	Moderate indirectness: Serious	Delayed ART probably increases mortality in mpox patients as inferred from comparison of delayed versus early ART in HIV
Mortality (low risk)	Odds ratio: 2.08 (CI95: 1.08 — 3.99) Data from 7418 participants in 3 studies	6.0 per 1000 Difference: 3.0 more (95%CI: 0.0 fewer to 9.0 more)	3.0 per 1000	Moderate indirectness: Serious	Delayed ART probably increases mortality in mpox patients as inferred from comparison of delayed versus early ART in HIV
Hospitalization	Odds ratio: 7.0 (CI95: 0.29 — 167.93) Data from 19 participants in 1 study	385.0 per 1000 Difference: 303.0 more (95%CI: 57.0 fewer to 856.0 more)	82.0 per 1000	Very low risk of bias: Serious imprecision: Serious	We are uncertain about the effect of delayed versus early ART initiation in mpox on hospitalisation
IRIS	Odds ratio: 1.13 (CI95: 0.06 — 21.09) Data from 19 participants in 1 study	112.0 per 1000 Difference: 12.0 more (95%CI: 93.0 fewer to 601.0 more)	100.0 per 1000	Very low risk of bias: Serious imprecision: Serious	We are uncertain about the effect of delayed versus early ART initiation in mpox on occurrence of IRIS

Delayed ART [Intervention] vs Early ART [Comparator]

HIV with Mpox [Population]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary
		Delayed ART	Early ART		
Dichotomous outcomes					
Mortality (high risk)	Odds ratio: 2.08 (CI95: 1.08 — 3.99) Data from 7418 participants in 3 studies	91.0 per 1000 Difference: 45.0 more (95%CI: 3.0 more to 115.0 more)	46.0 per 1000	Moderate indirectness: Serious	Delayed ART probably increases mortality in mpox patients as inferred from comparison of delayed versus early ART in HIV
Mortality (low risk)	Odds ratio: 2.08 (CI95: 1.08 — 3.99) Data from 7418 participants in 3 studies	6.0 per 1000 Difference: 3.0 more (95%CI: 0.0 fewer to 9.0 more)	3.0 per 1000	Moderate indirectness: Serious	Delayed ART probably increases mortality in mpox patients as inferred from comparison of delayed versus early ART in HIV
Hospitalization	Odds ratio: 7.0 (CI95: 0.29 — 167.93) Data from 19 participants in 1 study	385.0 per 1000 Difference: 303.0 more (95%CI: 57.0 fewer to 856.0 more)	82.0 per 1000	Very low risk of bias: Serious imprecision: Serious	We are uncertain about the effect of delayed versus early ART initiation in mpox on hospitalisation
IRIS	Odds ratio: 1.13 (CI95: 0.06 — 21.09) Data from 19 participants in 1 study	112.0 per 1000 Difference: 12.0 more (95%CI: 93.0 fewer to 601.0 more)	100.0 per 1000	Very low risk of bias: Serious imprecision: Serious	We are uncertain about the effect of delayed versus early ART initiation in mpox on occurrence of IRIS

Therapeutics used for the treatment of human mpox [Intervention] vs Placebo or standard care (supportive management and procedures required for specific symptoms and complications) or another study drug. [Comparator]

Individuals with mpox virus infection confirmed by reverse transcription polymerase chain reaction (RT-PCR) [Population]

Outcome	Study results and measurements	Absolute effect estimates Therapeutic intervention Placebo or standard care		Certainty of the evidence	Plain language summary
Dichotomous outcomes					
Admission to hospital					There is no available evidence from randomised clinical trials.
Clinical progression					There is no available evidence from randomised clinical trials.
Risk of transmission (detectable virus in clinical sample)					There is no available evidence from randomised clinical trials.
Time to healing of all skin lesions					There is no available evidence from randomised clinical trials.
Scarring					There is no available evidence from randomised clinical trials.
Mortality (Timeframe: within 28 days)					There is no available evidence from randomised clinical trials.
Raised liver enzymes (transaminitis 5xULN)	Data from 1 participants in 2 studies	3.0 per 1000		Low risk of bias: Serious	We are highly uncertain about the real rates of raised liver enzymes related to tecovirimat during treatment of mpox, although this appears to be infrequent.
Complications related to disease					There is no available evidence from randomised clinical trials.
Clinical progression					There is no available evidence from randomised clinical trials.
Continuous outcomes	Pain	(Measured by: [better])			There is no available evidence from randomised clinical trials.

Continue breastfeeding and direct contact [Intervention] vs Breastfeeding and no direct contact (expressed milk) [Comparator]

People with suspected or confirmed mpox without lesions on the breast who are breastfeeding their infant [Population]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary
		Breastfeed + contact	No breastfeeding + no contact		
Dichotomous outcomes					
Mpox disease in infant	Data from 6 participants in 5 studies	83.0 per 100	0.0	Low risk of bias: Very serious imprecision: Serious	Breastfeeding and direct contact between mpox infected mother with no lesions on the breasts and the infant, may increase the rate of infection of the infant. We do not know how breastfeeding and direct contact between mpox infected mother with no lesions on the breasts and the infant, affects the frequency of infection of the infant.
Hospitalization of infant due to mpox	Data from 6 participants in 5 studies	67.0 per 100	0.0	Low risk of bias: Very serious imprecision: Serious	Breastfeeding and direct contact between mpox infected mother with no lesions on the breasts and the infant, may increase hospitalisation of the infant. We are very uncertain of the magnitude of hospitalization of infants that occurs as a result of breastfeeding and direct contact of mothers with no lesions on the breasts and the infant
Infant mortality	Data from 6 participants in 5 studies	17.0 per 100	0.0	Low risk of bias: Very serious imprecision:	Breastfeeding and direct contact between mpox infected mother with no lesions on the breasts and the

Adverse events of not
breastfeeding for infant
and mother
Adverse events of no
direct contact for infant
and mother (expressed
milk)

Serious

infant, may increase infant
mortality. We are very
uncertain of the magnitude of
increase in infant mortality
that may result
from breastfeeding and direct
contact between mpox
infected mother with no
lesions on the breasts and the
infant.
Not reported in included
studies

Not reported in included
studies

Continue breastfeeding and no direct contact (expressed milk) [Intervention] vs Stop breastfeeding and no direct contact [Comparator]

People with suspected or confirmed mpox without lesions on the breast who are breastfeeding their infant [Population]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary
		Breastfeed + no contact	No breastfeeding + no contact		
Dichotomous outcomes					
Mpox disease in infant	Data from 1 participants in 1 study		0.0	Very low risk of bias: Very serious imprecision: Very serious	We do not know how breastfeeding and no direct contact (expressed milk) between mpox infected mother with no lesions on the breasts and the infant affects the infection of the infant.
Hospitalization of infant due to mpox	Data from 1 participants in 1 study		0.0	Very low risk of bias: Very serious imprecision: Very serious	We do not know how breastfeeding and no direct contact between mpox infected mother with no lesions on the breasts and the infant affects the hospitalization of the infant.
Infant mortality	Data from 1 participants in 1 study		0.0	Very low risk of bias: Very serious imprecision: Very serious	We do not know how breastfeeding and no direct contact between mpox infected mother with no lesions on the breasts and the infant affects infant mortality.
Adverse events of not breastfeeding for infant and mother					Not reported in included studies
Adverse events of no direct contact for infant and mother (expressed milk)					Not reported in included studies

Continue breastfeeding and direct contact [Intervention] vs Stop breastfeeding and no direct contact [Comparator]

People with suspected or confirmed mpox without lesions on the breast who are breastfeeding their infant [Population]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary
Dichotomous outcomes		Breastfeed + contact	No breastfeeding + no contact		
Mpox disease in infant	Data from 7 participants in 5 studies	83.0 per 100	0.0	risk of bias: Very serious	Breastfeeding and direct contact between mpox infected mother with no lesions on the breasts probably results in infection of some infants. We are very uncertain of the magnitude of any increase in mpox infection in infants as a result of breastfeeding and direct contact between mpox infected mother with no lesions on the breasts and the infant.
Hospitalization of infant due to mpox	Data from 6 participants in 5 studies	67.0 per 100	0.0		Breastfeeding and direct contact between mpox infected mother with no lesions on the breasts and the infant, probably results in some hospitalizations We are very uncertain of the magnitude of hospitalization of infants that occurs as a result of breastfeeding and direct contact of mothers with no lesions on the breasts and the infant.
Infant mortality	Data from 6 participants in 5 studies	17.0 per 100	0.0		Breastfeeding and direct contact between mpox infected mother with no lesions on the breasts and the infant, may increase infant mortality We are very uncertain of the magnitude of any increase in infant deaths that may occur as a result of breastfeeding and direct contact between mpox infected mother with no lesions on the breasts and the infant
Adverse events of not breastfeeding for infant and mother					Not reported in included studies
Adverse events of no direct contact for infant and mother (expressed milk)					Not reported in included studies

Continue breastfeeding and no direct contact (expressed milk) [Intervention] vs Stop breastfeeding and no direct contact [Comparator]

People with suspected or confirmed mpox with lesions on the breast who are breastfeeding their infant [Population]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary
		Breastfeed + no contact	No breastfeeding + no contact		
Dichotomous outcomes					
Mpox disease in infant					No studies. We do not know the effect.
Hospitalization of infant due to mpox					No studies. We do not know the effect.
Infant mortality					No studies. We do not know the effect.
Adverse events of not breastfeeding for infant and mother					Not reported in included studies
Adverse events of no direct contact for infant and mother (expressed milk)					Not reported in included studies

Continue breastfeeding and direct contact [Intervention] vs Stop breastfeeding and no direct contact [Comparator]

People with suspected or confirmed mpox without lesions on the breast who are breastfeeding their infant [Population]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary
		Breastfeed + contact	No breastfeeding + no contact		
Dichotomous outcomes					
Mpox disease in infant	Data from 7 participants in 5 studies	83.0 per 100	0.0	risk of bias: Very serious	Breastfeeding and direct contact between mpox infected mother with no lesions on the breasts probably results in infection of some infants. We are very uncertain of the magnitude of any increase in mpox infection in infants as a result of breastfeeding and direct contact between mpox infected mother with no lesions on the breasts and the infant.
Hospitalization of infant due to mpox	Data from 6 participants in 5 studies	67.0 per 100	0.0		Breastfeeding and direct contact between mpox infected mother with no lesions on the breasts and the infant, probably results in some hospitalizations We are very uncertain of the magnitude of hospitalization of infants that occurs as a result of breastfeeding and direct contact of mothers with no lesions on the breasts and the infant.
Infant mortality	Data from 6 participants in 5 studies	17.0 per 100	0.0		Breastfeeding and direct contact between mpox infected mother with no lesions on the breasts and the infant, may increase infant mortality

Adverse events of not
breastfeeding for infant
and mother
Adverse events of no
direct contact for infant
and mother (expressed
milk)

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direct contact between mpox
infected mother with no lesions
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Not reported in included
studies

Not reported in included
studies

Continue breastfeeding and no direct contact (expressed milk) [Intervention] vs Stop breastfeeding and no direct contact [Comparator]

People with suspected or confirmed mpox with lesions on the breast who are breastfeeding their infant [Population]

Outcome	Study results and measurements	Absolute effect estimates		Certainty of the evidence	Plain language summary
		Breastfeed + no contact	No breastfeeding + no contact		
Dichotomous outcomes					
Mpox disease in infant					No studies. We do not know the effect.
Hospitalization of infant due to mpox					No studies. We do not know the effect.
Infant mortality					No studies. We do not know the effect.
Adverse events of not breastfeeding for infant and mother					Not reported in included studies
Adverse events of no direct contact for infant and mother (expressed milk)					Not reported in included studies

Risk factors for severe disease or hospitalization in patients with mpox

Outcome	Study results and measurements	Absolute effect estimates	Certainty of the evidence	Plain language summary
Dichotomous outcomes				
Age (per 10 years increase)	Odds ratio: 0.88 (CI95: 0.63 — 1.23) Data from 16939 participants in 6 studies		Low inconsistency: Serious imprecision: Serious	Age may be associated with little or no increase in severe disease or hospitalization.
Sex (males vs females)	Odds ratio: 0.78 (CI95: 0.34 — 1.78) Data from 5501 participants in 3 studies		Low inconsistency: Serious imprecision: Serious	Males may be associated with little or no increase in severe disease or hospitalization compared with females.
HIV (positive vs negative)	Odds ratio: 1.79 (CI95: 1.07 — 3.0) Data from 9883 participants in 7 studies		Moderate inconsistency: Serious	HIV is probably associated with increased odds of severe disease or hospitalization.
HIV (CD4 < 350 cells/mm ³ vs HIV negative)	Odds ratio: 2.45 (CI95: 1.19 — 5.02) Data from 2321 participants in 2 studies			Patients with CD4 < 350 cells/mm ³ are associated with increased odds of severe disease or hospitalization compared with HIV negative patients.
HIV (CD4 ≥ 350 cells/mm ³ vs HIV negative)	Odds ratio: 0.82 (CI95: 0.55 — 1.22) Data from 2321 participants in 2 studies		Low inconsistency: Serious imprecision: Serious	Patients with CD4 ≥ 350 cells/mm ³ may be associated with little or no increase in severe disease or hospitalization compared with HIV negative patients.
Vaccination (mpox or smallpox)	Odds ratio: 0.88 (CI95: 0.57 — 1.36) Data from 7400 participants in 7 studies		Low inconsistency: Serious imprecision: Serious	Mpox or smallpox vaccination may be associated with little or no decrease in severe disease or hospitalization.
Vaccination (childhood or prior smallpox)	Odds ratio: 0.96 (CI95: 0.61 — 1.51) Data from 7032 participants in 6 studies		Low inconsistency: Serious imprecision: Serious	Childhood or prior smallpox vaccination may be associated with little or no decrease in severe disease or hospitalization.

Risk factors for all-cause mortality in patients with mpox [Population]

Outcome	Study results and measurements	Absolute effect estimates	Certainty of the evidence	Plain language summary
Dichotomous outcomes				
HIV (positive vs negative)	Odds ratio: 10.81 (CI95: 9.8 — 11.92) Data from 2277 participants in 2 studies			HIV is associated with increased odds of all-cause mortality.

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