Background

Since 13 May 2022, cases of Monkeypox virus (MPX) infection have been reported in multiple countries that do not have endemic monkeypox virus in animal or human populations, including countries in Europe, North America and Australasia. Epidemiological investigations are ongoing and reported cases thus far have no established travel links to an endemic area. This suggests significant community transmission in multiple non-endemic countries in recent weeks.

Epidemiology

Cases of monkeypox in non-endemic countries are usually imported and associated with travel to endemic areas or contact with animals brought from such areas; these introductions do not usually result in local ongoing transmission. In the current outbreak, a different epidemiological pattern is emerging. In the UK, there seems to be multiple parallel importations, with further local spread via sexual contact; the majority of individuals infected via sexual contact are self-identified as gay, bisexual and other men who have sex with men (gbMSM) and report multiple sexual partners in the weeks preceding illness.

Transmission route

The highest risk of transmission is considered to be through direct contact with a confirmed case, droplets or contaminated surfaces and objects. The highest risk period for transmission is understood to be from the onset of early symptoms until lesions have scabbed over and the scabs have fallen off. There is no current evidence that individuals are infectious before the onset of early symptoms. As transmission through the usual routes requires direct close contact with infected material, the overall risk to the general population remains low; this is being monitored very closely by public health authorities. Possible transmission via substances of human origin (SOHO) is being considered separately.

Clinical presentation

After infection, the incubation period is usually 6-14 but can be up to 21 days. It is believed that most infections will result in symptoms. The prodromal phase characteristically includes fever, myalgia and lymphadenopathy.

All reported UK cases have been identified as the West African clade through rapid molecular testing. Illness is generally mild and self-limiting, consistent with the clinical presentation associated with the West African clade in comparison to the more virulent Central African clade.

There remains uncertainty over potentially increased severity in children and in individuals who are highly immunocompromised or pregnant.

Information about clinical complications come from cases in endemic countries; these include pulmonary distress or bronchopneumonia, often late in the course of illness, suggestive of secondary infection of the lungs. Encephalitis is another rare complication. Ocular infections can occur and may result in corneal scarring and permanent vision loss. Vomiting or diarrhoea can occur by the second week of illness and can contribute to severe dehydration. Pitted scarring is the most common long-term sequelae. The average case-fatality rate can vary between 1- 10%, depending on various factors, including the clade of the virus, previous immunity and age; children are often more prone to severe forms of disease.

Prophylaxis and treatment

Other sources should be consulted for information on prophylaxis (vaccination) and anti-virals. Brief notes are included below:

Vaccine- MVA-BN (Imvanex)

MVA-BN is the only 3rd generation smallpox vaccine approved in Europe. It has not been specifically licenced for the prevention of Monkeypox in Europe, but it has been used in the UK in response to previous incidents. It contains a live-attenuated modified vaccinia virus which is replication incompetent, with very low replicative capacity and low neuropathogenicity.

It is therefore not contra-indicated during pregnancy, breastfeeding and for immunocompromised individuals.

The recommendations for pre and post-exposure prophylaxis can be found here:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1079498/Recommendations-for-pre-and-post-exposure-vaccination-during-a-monkeypox-incident-27-may-2022.pdf

Anti-virals (Tecovirimat , Cidofovir and Brincidofovir)

There are no specific treatment for monkeypox but antivirals used for smallpox have been utilised, including in previous UK cases.

An interim clinical guidance for the treatment of Monkeypox can be found here:

https://www.cdc.gov/poxvirus/monkeypox/treatment.html

Monkeypox and transplantation

Viraemia and risk of transmission via solid organs and other substances of human origin

Orthopox viruses have been studied in animal models. Primary and secondary viraemia occur during the incubation period and this is largely cell-associated. Viral DNA has also been detected in blood some 3 to 4 weeks post onset of illness and after resolution of skin rash (Adler et al., Lancet May 2022).

To date, there are no reports of MPX transmission through SOHOs. There remains a theoretical risk of transmission as viraemia is known to occur and the general population is largely susceptible to MPX.

This risk would be during the incubation period, and detailed history should identify exposures to cases or links to increased risk activities.

It is expected that symptomatic cases should be identified early and will not be eligible to donate. There is always the possibility of missed diagnosis or atypical cases. Donation teams to remain aware of updates and vigilant during donor characterisation.

Table 2 summarises the current suitability for organ donation as regards to Monkeypox infection.

Table 1: Case definitions (for up to date case definition, see https://www.gov.uk/guidance/monkeypox-case-definitions)

CONFIRMED	Laboratory confirmed MPX infection (PCR positive)
PROBABLE	Unexplained rash on any part of the body plus one or more classical symptoms of MPX infection since 15 March 2022 and either: - An epidemiological link to a conformed or probable case in the 21 days before symptom onset OR - Travel to West or Central Africa in the 21 days before symptoms onset OR - GBMSM with acute febrile illness (>38.5^{0}C), intense headaches, myalgia, arthralgia, back pain, lymphadenopathy
POSSIBLE	- Febrile prodrome compatible with MPX: fever (>38.50C), intense headaches, myalgia, arthralgia, back pain, lymphadenopathy AND contact with a confirmed case in the 21 days prior to symptom onset OR - High clinical suspicion of MPX (e.g. classical presentation without contact history, atypical presentation with exposure risk)

Abbreviations: Monkeypox virus (MPX); Gay, bisexual or other man who has sex with men (gbMSM)

Table 2: Monkey pox infection and suitability for organ donation

This situation is evolving and guidance will be updated as new evidence emerges. The current position is precautionary, given the early stages of the outbreak. People who have possible, probable or confirmed monkeypox and are well can now isolate at home; these individuals are being followed up by the health protection teams so mis-information is unlikely but organ donation teams should be aware and attentive to possible scenarios. Current generic Monkeypox guidance can be accessed here: https://www.gov.uk/government/collections/monkeypox-guidance

	Organ donation		Notes
Proven case (current)	Contra-indicated		
Proven case (past)	Donation may be considered from 8 weeks after complete recovery from illness	Must have been discharged from clinical and public health follow u.	Small retrospective observational series: MPX DNA detected in blood after resolution of skin rash, time points tested up to day +30 post disease onset and some 2 weeks past point of resolution of skin rash. https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(22)00228-6/fulltext
Probable case	Contra-indicated		
Possible case	Contra-indicated		
Contact of case in the previous 21 days	Contra-indicated (Categories 2, 3, 4) *	Contact category 1 are deemed low risk and can be considered for organ donation following assessment by an infection specialist (mainly to exclude early symptoms of possible MPX infection)	Infectiousness via droplet not demonstrated in the prodromal period but pre-symptomatic viraemia occurs.
Vaccinee	See risk regarding “contact of case”	The vaccine is not a risk as it contains a defective vaccinia virus; assessment needs to be done in regards to the risk from exposure to the index case.	

*Contact tracing classification:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1079483/20220527_monkeypox-contact-tracing-classification-and-vaccination-matrix_v6.7.pdf