

Monkeypox Virus and Plasma Protein Therapies

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PPTA considers that the current MPXV outbreak is not a concern for the safety margins of plasma protein therapies manufactured by PPTA member companies. This assessment is also shared by other concerned parties (AABB, WHO).

Since May 2022, Monkeypox virus (MPXV) infections have been reported in non-endemic countries across Europe and North America (*WHO, CDC, ECDC*). People who use plasma protein therapies are understandably concerned about whether their therapies remain safe, with respect to MPXV. To address this issue, PPTA has summarized currently available facts.

MPXV does not spread easily between people. The virus is transmitted between humans (=human-human transmission) through close contact with infectious material from the skin lesions of an infected person. It also spreads through large respiratory droplets during prolonged face-to-face contact, through touching lesion material and contaminated surfaces or objects such as bedding, linen, eating/ personal hygiene utensils (=fomites). Transmission may occur during sexual intercourse. While the current outbreak has predominantly affected men who have sex with men, MPXV is generally not considered a sexually transmitted infection. The clinical presentation of most cases has been described as mild.

The safety margins of plasma protein therapies are not affected by MPXV based on the following facts:

- There is no reported evidence for the transmission of MPXV by blood and blood components, including by plasma and plasma-derived medicinal products. While MPXV DNA has been detected in blood and semen (*Noe et al, 2022, WHO Q&A*), infectivity was not demonstrated in blood or plasma. The risk of transfusion-transmission of MPXV at this stage therefore remains theoretical (*AABB*). For plasma protein therapies, any risk is mitigated due to the effectiveness of established manufacturing processes (below).
- The MPX virus belongs to the *Poxviridae* virus family, like smallpox, vaccinia and cowpox viruses. Due to their large size (approximately 140-260 nm in diameter, 220-450 nm in length) and their lipid envelope, this group of viruses is susceptible to virus inactivation and removal steps typically used in manufacturing processes of plasma derivatives. These include caprylate- or solvent-detergent (S/D) treatments, low pH incubation, pasteurization, dry-heat treatments and nanofiltration (*AABB Bulletin, 2006*). Poxviruses have even been shown to be removed by sterile filtration as used during the manufacture of plasma derivatives (*Berting et al., 2005*).
- Donor screening procedures make it highly unlikely that any person showing disease symptoms typical of MPXV would be accepted for donation. Symptoms generally associated with MPXV include raised temperature/fever, fatigue, headache, enlarged lymph nodes and skin lesions.

Given this currently available scientific evidence, PPTA considers that MPXV infectivity does not occur in plasma or is low. Due to the characteristics of the virus and multiple, complimentary steps with significant and robust virus removal and virus reduction capacity utilized during manufacturing of plasma protein therapies, PPTA considers that the current MPXV outbreak is not a concern for the safety margins of plasma protein therapies manufactured by PPTA member companies.

References:

WHO. Multi-country monkeypox outbreak in non-endemic countries, <https://www.who.int/emergencies/disease-outbreak-news/item/2022-DON385>. 21 May 2022.

WHO Q&A. Monkeypox. https://www.who.int/news-room/questions-and-answers/item/monkeypox?gclid=Cj0KCQjwzLCVBhD3ARIsAPKYTcRzwuzg5TOvS9Zm4Y61twuJbq0Vd207F4tgvijisWH92_HaF_zpP7QaAmbjEALw_wcB. 20 May 2022.

CDC. Monkeypox. <https://www.cdc.gov/poxvirus/monkeypox/index.html>

ECDC. Risk assessment: Monkeypox multi-country outbreak. <https://www.ecdc.europa.eu/en/publications-data/risk-assessment-monkeypox-multi-country-outbreak>. 24 May 2022.

Noe et al., Clinical and virological features of first human Monkeypox cases in Germany. 2022 (preprint). <https://www.researchsquare.com/article/rs-1725831/v1>

AABB. Monkeypox Virus https://www.aabb.org/docs/default-source/default-document-library/regulatory/eid/130s.pdf?sfvrsn=652b9f22_2 2009

Berting A, Goerner W, Spruth M, Kistner O, Kreil TR. Effective poxvirus removal by sterile filtration during manufacture of plasma derivatives. J. Med. Virol. 2005. 75:603-7