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Viable mpox in the inanimate environmental and risk of transmission

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As of August 23, 2023, 30,767 mpox cases have been reported in the United States (https://www.cdc.gov/poxvirus/mpox/response/2022/index.html). Although mpox is primarily transmitted through contact with an infected individual, recent investigations have demonstrated potential mpox transmission from patients to healthcare workers after contact with contaminated bedding[1] or other fomites.[2] In support of such findings, viable mpox virus has been detected on various surfaces in home and hospital settings of infected individuals (Table 1).[3–8] One quantitative study of viable mpox virus in a residential setting found the highest level on underwear.[3] Viable mpox has been detected on household surfaces for up to 15 days, but at low titers suggesting a lesser potential for transmission.[3] Mpox survival in the environment is highly dependent on surrounding temperature and humidity,[9] as well as the porosity of a contaminated object.[3] When mpox mixed with blood or albumin was inoculated on stainless steel at 37°C, no viable mpox could be recovered after 6 and 7 days, respectively, 10 and 11 days, respectively at 22°C, but up to 30 days at 4°C for mpox mixed with either blood or albumin.[9]

Based on the data reviewed above, healthcare workers should follow guidance regarding personal protective equipment upon entering the immediate environment of a patient with known or suspected mpox, regardless of whether or not the healthcare worker intends to have direct contact with the patient.[10] In addition, emphasis should also be placed on careful removal of personal protective equipment to prevent self-contamination while doffing and practicing hand hygiene thereafter. Lastly, cleaning environmental surfaces in the rooms of such patients should be done using products with mpox cidal activity.[9,10]

Table 1. Detection of Mpox on Surfaces in Home and Hospital Settings

Authors	Home	Hospital
	Viable mpox virus detected on household surfaces	Viable mpox virus detected on hospital room surfaces
Morgan et al[3]	Paper towels, underwear, blanket, towel, mattress cover, tabletop	. . .
Atkinson et al[4]	Mattress and sheet, towel, iPad, door handle, sink tap, duvet, sofa, hall light switch	. . .
Pfeiffer et al[5]	. . .	No viable virus detected
Nörz et al[6]	. . .	Soap dispenser handle, towel, glove after touching objects
Gould et al[7]	. . .	Anteroom floor after PPE doffing
Marimuthu et al[8]	. . .	Chair in patient room, toilet seat, linen dust

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Environmental contamination of postmortem blood cultures detected by whole-genome sequencing surveillance

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To the Editor—Postmortem blood cultures may assist in diagnosing a previously undetermined infection contributing to death or confirming a diagnosed infection prior to death. The collection of the blood culture during autopsy commonly entails aseptically obtaining blood from the heart. The clinical utility of postmortem blood cultures is highly debated given potential for bacterial translocation or contamination.[1] Whole-genome sequencing (WGS) can identify patient infections that are epidemiologically related, indicating transmission or a common source. At our hospital, we recently initiated a WGS program called Enhanced Detection System for Healthcare-Associated Transmission (EDS-HAT) to enable early detection, investigation, and intervention of hospital outbreaks of bacterial pathogens.[2–5] Here, we describe a pseudo-outbreak related to postmortem blood cultures that was incidentally detected by EDS-HAT.

Methods

This study was performed at the University of Pittsburgh Medical Center (UPMC) Presbyterian Hospital, an adult, tertiary-care facility with surrounding affiliated UPMC hospitals. Ethics approval for this study was obtained from the University of Pittsburgh Institutional Review Board, the University of Pittsburgh Committee for Oversight of Research and Clinical Training Involving Decedents, and the UPMC Quality Review Committee.

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Beginning in November 2021, isolates from clinical specimens (including postmortem cultures) for select bacterial pathogens were collected and sequenced if the patient had been hospitalized for ≥2 days and/or had had a UPMC exposure in the prior 30 days.[5] Isolates were sequenced weekly using methods previously described and were examined for genetic relatedness.[5]

We observed autopsy practices in March 2022 and performed environmental cultures of the autopsy suite in May 2022. Cultures were taken using a sterile swab from the sink faucet where a hose connected to the table drain. Swabs were plated on MacConkey Agar containing sorbitol and colistin and were incubated for 48 hours at 35°C.[6]

Data on the number of autopsies and blood cultures performed at UPMC Presbyterian from October 2021 through June 2022 were obtained. Data on possibly contaminated blood cultures, defined as any organism related by WGS without plausible epidemiological links, were merged with unique patient blood-culture isolates and autopsies to calculate an autopsy blood-culture contamination rate.

Results

From October 2021 through June 2022, we detected 4 clusters of genetically related bacterial species among 13 patients who had undergone autopsy at UPMC Presbyterian (Table 1). Initial investigation revealed that each patient had a brief inpatient stay at 1 of 3 UPMC hospitals and after death had been transported to UPMC Presbyterian for autopsy, suggesting a point source in the autopsy suite. One patient had an antemortem blood culture with *S. marcescens* that was genetically distinct from their postmortem blood