* Corresponding author. Address: Department of Urology, Hôpital du Kremlin Bicêtre, 78 Rue du Général Leclerc, 94270 Le Kremlin-Bicêtre, France. Tel.: +33 145212419.
E-mail address: pierre.pescheloche@gmail.com
(P. Pescheloche)

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Healthcare worker screening in *Streptococcus pyogenes* outbreaks using throat and perineal swabs

Sir,

We read with interest the letter from Meda *et al*. in relation to our recent article on the outbreak of invasive group A streptococcal (iGAS) infection using agar settle plates to detect perineal shedding from a healthcare worker (HCW) [1,2]. We are grateful for the opportunity to discuss the outbreak and its management in more detail and value this feedback from our colleagues.

We fully agree with Meda *et al*. that the screening of HCWs is a sensitive subject and should only be carried out after careful consideration. The ongoing nature of our outbreak despite the implementation of additional cleaning measures and the questioning/screening of staff (to identify symptomatic GAS carriage) necessitated this additional action. As Meda *et al*. highlight, it is recognized that HCW screening can have a significant psychological impact. However, with a mortality rate of 8–23% for severe GAS infections [3–5], staff screening is often required to prevent cross-transmission, as they are also at risk of acquisition. Good occupational health support is imperative when HCW screening is performed. Their involvement in an outbreak at an early stage allows for a seamless transition from detection, treatment and ongoing follow-up/psychological support for any affected HCW.

Meda *et al*. have questioned our proposal to perform throat and perineal swabs as initial screening sites for HCWs in iGAS outbreaks. This is not a novel idea; in fact, the US Centers for Disease Control and Prevention recommend that, in an outbreak situation, HCW screening should involve anal, skin lesion, throat and vaginal swabs [6]. Furthermore, we disagree that perineal swabs should only be considered later, on the basis that they are a significantly invasive test. Perineal swabs are performed on thousands of patients everyday across healthcare organizations in the UK and worldwide for meticillin-resistant *Staphylococcus aureus* screening, and this is considered accepted practice. In essence, the HCW becomes a patient when under the care of an occupational health physician. It is also worth noting that in this outbreak, no staff member refused any part of the screening process. This was possibly due to the communication undertaken by both the infection prevention and control team and occupational health teams to help address any HCW concerns.

Perineal swabs were obtained in this outbreak due to ongoing patient cases despite screening HCWs using throat swabs. HCW 9 was screened after Cases A, B and C had been detected. At this time, only throat swabs were performed and HCW 9 was negative. If our conclusion that HCW 9 was the ongoing source of the outbreak is correct, had we performed perineal screening initially (after Cases A, B and C), the outbreak may have been halted prior to the ongoing infection of the fourth (D) and fifth cases (E). It would also have saved time and resources for minimal additional work. Many HCWs may not volunteer that they have symptoms such as pruritis ani, and a universal approach to perineal swabs being taken may bypass this problem and reduce any stigma the individual HCW may feel.

Further weight to dispersal from perineal carriage is provided by negative settle plates on the five days when HCW 9 was not on shift. This is despite the fact that only one other HCW (HCW 75) who had GAS isolated from their throat was on shift during these times. This suggests that shedding may be higher from perineal than from throat GAS carriage. If this is the case, this adds weight to performing perineal screens earlier rather than later in an outbreak situation.

Additional reasons for considering timely perineal screens are that the result may alter subsequent treatment and screening of the HCW. It has been shown that rectal carriage of GAS (likely to be similar to perineal carriage) is difficult to eradicate with penicillin-based regimens [6]. HCW 9 cleared throat carriage but not perineal carriage following a course of penicillin. Clindamycin and azithromycin have been suggested for those with rectal carriage for GAS if the isolate is susceptible [6]. Indeed, HCW 9 cleared their perineal carriage following a course of azithromycin, local mupirocin cream and chlorhexidine body washes. The presence of GAS on perineal swabs may therefore alter which treatment is chosen as the first-line treatment to eradicate GAS carriage, and perineal swabs are of importance to screen reliably for clearance of carriage. In view of this, we feel that having this information from the outset improves outbreak management and its efficiency.

We agree with Meda *et al*. that whole-genome sequencing may provide further information and can be used to construct phylogenetic trees. However, our organization has an excellent surveillance system, and we were able to detect inpatients with GAS infection and those that been discharged and then re-admitted to completely different hospital areas. Using this surveillance system, four iGAS cases in patients who were, or recently had been, on one medical ward was highly unusual and provided strong epidemiological data for cross-transmission. Furthermore, all patient isolates and the perineal GAS isolate from HCW 9 were identical (*emm* 28.0). It is also important to highlight that national surveillance data for iGAS isolates in England is reported using *emm* typing, and we liaised with the national reference laboratory (Public Health England) during the outbreak for support in comparing isolates [7].

In conclusion, we continue to advocate that perineal swabs are a useful tool that can be utilized early on in HCW screening during iGAS outbreaks. Not only may they improve detection of GAS carriage, but they may also influence the choice of eradication therapy used. In addition, it is our opinion that when epidemiology strongly indicates isolates are linked, there is no added benefit of whole-genome sequencing.

Conflict of interest statement
None declared.

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K. Prescott
N. Mahida*
T. Boswell
Department of Clinical Microbiology, Nottingham University Hospitals NHS Trust, Nottingham, UK

* Corresponding author. Address: Department of Clinical Microbiology, Nottingham University Hospitals NHS Trust, QMC Campus, Derby Road, Nottingham NG7 2UH, UK. Tel.: +44 (0) 115 9249924 Ext 61161; fax: +44 (0)115 970 9767.
E-mail address: nikunj.mahida@nuh.nhs.uk (N. Mahida)

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