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Nail polish used by healthcare personnel does not increase the rate of healthcare-associated infections

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To the Editor,

We have read with great interest the recent practice recommendations by Glowitz et al on the prevention of healthcare-associated infections (HAIs) through hand hygiene that were published in your journal.[1] The guidelines cover all aspects of hand hygiene relevant to the prevention of HAIs. However, the data and recommendations related to the use of nail polish among scrubbed individuals who interact with the sterile field should be more thoroughly and accurately discussed. The authors recommend that "*these individuals should not wear fingernail polish or gel shellac*" and rate the quality of evidence for this recommendation as HIGH, but they cite only one original study.[2] In that study, investigators evaluated the bacterial burden of gel nails, standard nail polish, and natural, unpolished nails on the hands of healthcare personnel both before and after hand hygiene with an alcohol-based hand rub 1, 7, and 14 days after product application. The study results were "*Reductions in the bacterial burden of natural nails and standard polish, but not gel polish, (P = .001, P = .0028, and P = .98, respectively) were seen after hand hygiene. All three nail types become more contaminated with bacteria over time. Standard polish and natural nails may be more amenable to hand hygiene than gel polish.*" They also reported, however, that "*posthand hygiene mean CFUs did not differ significantly between groups.*" Several other recent studies have come to similar conclusions. For example, in one study, investigators compared the microbial burden of unpolished nails to that of nails with 1-day and 4-day-old standard nail polish.[3] They found that 1-day-old polish exhibited fewer gram-positive microorganisms than unpolished nails (599 colony-forming units (CFUs) vs 771 CFU, $P = .04$) and that 4-day-old polish showed significantly more gram-positive microorganisms than 1-day-old polish (925 CFU vs 599 CFU, $P = .03$). A similar trend was observed for gram-negative microorganisms, but the differences were not statistically significant. Another study came to similar results "*The risk of growing a pathogenic microorganism after hand disinfection due to nails coated with a conditioner or a hybrid varnish was similar to that of natural nails.*"[4] The investigators noted, however, that a long-lasting regular nail varnish increased the risk of ineffective hand hygiene. It should be noted that these studies assessed the bacterial burden of fingernails but did not assess the impact of nail polish on HAIs. Therefore, these studies cannot be used as definitive evidence that nail polish increases the risk of HAIs.

Fewer studies have assessed the impact of nail polish and gel shellac on the effectiveness of surgical hand scrub. The authors of the most recent Cochrane Database systematic review of this topic, published in 2014, concluded that there was "insufficient evidence to determine whether wearing nail polish affects the number of bacteria on the skin post-scrub."[5] A more recently reported randomized controlled trial found no significant differences in the reduction of viable bacterial counts after a surgical hand scrub performed 1 and 14 days after a manicure between natural nails and nails coated with gel nail polish.[6] At the time of the most recent Cochrane Database review, there had been no trials of the impact of nail polish on rates of surgical site infection (SSI).[5] Since that time, however, the results of a block-randomized clinical trial conducted among surgical staff participating in cesarean deliveries found no difference in SSI rates between procedures performed by staff wearing nail polish (1.3%) and those performed by staff without nail polish (2.8%, $P = .155$).[7] Additionally, there was no difference in SSI rates between regular nail polish and gel nail polish (1.4% vs 1.4%, $P = .988$). SSI rates associated with chipped nail polish were higher than those associated with non-chipped nail polish (2.7% vs 0.9%), but this difference was not statistically significant ($P = .335$).

In conclusion, the available data suggest that some types of nail polish do not interfere with the effectiveness of routine hand hygiene or surgical scrub. Additionally, one recent study, published after the literature search was conducted for the hand hygiene practice recommendations,[1] suggests that the use of nail polish by surgical personnel does not increase the rate of SSIs after cesarean delivery. Our suggestion is to publish an addition to the recommendations by Glowitz et al about different types and conditions of nail polish, varnish, ultraviolet gels, and artificial

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Cite this article: Augustin G, Augustin K. Nail polish used by healthcare personnel does not increase the rate of healthcare-associated infections. *Infect Control Hosp Epidemiol* 2024. 45: 1021–1022, doi: 10.1017/ice.2024.31

fingernails in healthcare workers involved in sterile procedures and their potential for HAIs. The nail polish industry has advanced in the last few decades, and the quality and smoothness of these products may not reduce the effectiveness of hand hygiene or increase the risk of HAIs.

Acknowledgments. None.

Financial support. No funding.

Competing interests. The authors have no conflict of interest.

Disclosures. The authors have nothing to disclose.

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Letter in reply to: Nail polish used by healthcare personnel does not increase the rate of healthcare-associated infections

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We thank Augustin and Augustin[1] for their thoughtful response to the updated SHEA/IDSA/APIC Strategies to Prevent Healthcare-Associated Infections through Hand Hygiene.[2] In these updated recommendations, promotion of healthy hand skin and fingernails is considered the first essential practice. As you noted, there is a large body of evidence indicating the need to include fingernail care in hand hygiene policies. The high quality of evidence designation in the table you highlighted is intended to apply only to the inclusion of nailcare in facility-specific policies; the individual sub-bullets are provided as reasonable recommendations for Infection Prevention (IP) programs to consider when creating policies. We agree that evidence regarding the association between nail polish and healthcare-associated infection is not robust, and there is a theoretical concern for reducing the effectiveness of hand hygiene (eg, difficulty cleaning nail beds). In light of this, we therefore recommend that IP programs play a role in developing practical policies that consider patient and procedure risks relative to nail polish. The recommendation against use of nail polish is made only for scrubbed surgical personnel and aligns with domestic and international guidelines (United States Association of Perioperative Nurses, World Health Organization, and National Institute for Health and Care Excellence) which include removal of fingernail polish as a step in surgical hand antisepsis. We do not differentiate between various types of nail polish (eg, standard, gel shellac, ultraviolet) as it is not feasible for those charged with assessing adherence to determine which methods of nail polish application were used. As noted by Cochrane reviewers, randomized control trials linking nail polish or jewelry to surgical site infections are not likely to be done as it may not be possible to ethically conduct such studies.[3] IP programs conduct annual risk assessments and depending on their facility-specific risks and prevention priorities may choose to allow nail polish.

Financial support. We received no specific funding for this work.

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The authors report no potential conflicts of interest. The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention (CDC). This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy (see eg, 45 C.F.R. part 46.102(l)(2), 21 C.F.R. part 56; 42 U.S.C. §241(d); 5 U.S.C. §552a; 44 U.S.C. §3501 et seq).

Cite this article: Glowicz JB, Landon E, Ellingson KD. Letter in reply to: Nail polish used by healthcare personnel does not increase the rate of healthcare-associated infections. *Infect Control Hosp Epidemiol* 2024. 45: 1022, doi: 10.1017/ice.2024.32