Exposure to a Surrogate Measure of Contamination From Simulated Patients by Emergency Department Personnel Wearing Personal Protective Equipment

A major challenge with the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic is the effective protection of health care workers. Recommendations for the use of personal protective equipment to protect against SARS-CoV-2 exposure by health care workers were recently published by the World Health Organization and the US Centers for Disease Control and Prevention. For aerosol-generating procedures, N95 respirators, eye protection, isolation gowns, and gloves were recommended. Coveralls, boots with a cover, and hair coverings were not part of the recommended protective clothing.2,3

We assessed the protection of emergency physicians and nurses wearing the recommended personal protective equipment while caring for a simulated patient with respiratory distress.

Methods | A simulation study was conducted in the emergency department of Rambam Health Care Campus in Haifa, Israel, on March 21, 2020, examining the presence of a surrogate measure of contamination on exposed skin of participants wearing personal protective equipment to protect against SARS-CoV-2 exposure.4 Two scenarios of patients with respiratory distress requiring airway management similar to those commonly encountered in the emergency department were conducted using adult and child high-fidelity manikins.

Figure. UV Visualization of Contaminated Spots on the Skin of Participants

After completion of the simulation and before doffing, the fluorescent markers on the participants were visualized and photographed under UV light. Of 8 participants, 6 had markers on the neck (A and B) and 1 had markers on the ear (C). Distribution of the markers on all participants is shown with each color representing 1 participant (D).
Letters

manikin contacts. In the pediatric scenario, intubation was successful during the second laryngoscopic attempt. In the pediatric scenario, intubation was successful using direct laryngoscopy after 1 failed videolaryngoscopic attempt. Seven of 8 participants had fluorescent markers on their exposed skin, 6 on the neck, and 1 on an ear (Figure).

All team members had fluorescent markers on their hair and 4 had markers on their shoes. During the adult and pediatri- cian contacts.

Discussion | Despite personal protective equipment, fluorescent markers were found on the uncovered skin, hair, and shoes of participants after simulations of emergency department management of patients experiencing respiratory distress. The findings suggest that the current recommendations for personal protective equipment may not fully prevent exposures in emergency department settings. Clothing that covers all skin may further diminish exposure risk.

Inhalation of aerosols and exposure risks associated with doffing were not evaluated in this study. The small number of participants, the simulated health care setting, and the surrogate measures of exposure are the primary limitations. Because this was a simulation study using manikins, it is uncertain how the results might apply to actual patient care.

Oren Feldman, MD
Michal Meir, MD
Danielle Shavit, BSc
Ravit Idelman, MD
Itai Shavit, MD

Author Affiliations: Pediatric Emergency Department, Rambam Health Care Campus, Haifa, Israel (Feldman, Idelman, I. Shavit); Pediatric Infectious Diseases Unit, Rambam Health Care Campus, Haifa, Israel (Meir); Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Haifa, Israel (D. Shavit).

Corresponding Author: Itai Shavit, MD, POB 274, Kibutz Maayan Tzvi 3080500, Israel (itai@pern-database.org).


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Concept and design: Feldman, Meir, I. Shavit.

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Drafting of the manuscript: Feldman, Meir, I. Shavit.

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Supervision: Meir.

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