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Disinfection of personal protective equipment for management of Ebola patients

To the Editor:

Bessesen et al highlight the potential utility of reusable elastomeric face masks to bypass the risk of N95 respirator shortages during a respiratory illness pandemic and stress the importance of efficacious disinfection to reuse facial protective equipment safely.[1] We would like to take the opportunity to underline the need that awareness on personal protective equipment (PPE) stocks is included in any pandemic preparedness plan. The demand for PPE must be established on the basis of the health care facility's role, defined by public health authorities to create a coordinated network approach.[2]

Moreover, we agree that standard operating procedures (SOPs) should be developed to be used by health care workers (HCWs) to disinfect reusable PPE. In our recent experience with 2 Ebola cases at National Institute for Infectious Diseases "Lazzaro Spallanzani" in Rome, Italy, we followed a written protocol for management of patients with Ebola virus disease (EVD), developed and updated since the beginning of the current West Africa outbreak.[3] A voluntary clinical task force of infectious diseases specialists, intensivists, and nurses underwent rigorous training to became practiced and competent with the protocol and PPE donning-doffing discipline. PPE to be used was carefully selected according to international updated technical recommendations and lessons learned from previous experiences in endemic areas and western countries. The following 3 PPE options were selected: goggles-based option (goggles, splash-proof fit-tested FFP3-N95 respirator, disposable hood [covering head, neck, and shoulders] with integrated surgical type IIR face mask (high filtration efficiency and spash resistance), double or triple layer of gloves, rubber boots, full body head-to-foot impermeable biohazard suit, plastic apron); face mask—based option (elastomeric face mask with disposable filters rather than goggles-N95 respirator-hood); and powered air-purifying respirator (PAPR)—based option (with a PAPR [composed of hood, motor unit, waist belt, and breathing tube to be put on the suit] rather than goggles-disposable hood). PAPR use was recommended in performing an aerosol-generating procedure and had always been used by intensivists providing critical care. Otherwise, the PAPR was used by HCWs expecting to spend long periods of time while caring for patients, according to a personal choice on safety and comfort. All of the PPE was disposable, except for the goggles, face masks, and PAPR components. We developed written SOPs for PPE disinfection whenever performed by a HCW under supervision of another member of the task force, who virtually was the next user. Similar to Bessesen at al, we used a 0.5% chlorine solution as the disinfectant, according to the World Health Organization's guidance for care of patients with EVD.[4] Before exiting the isolation area, the HCWs in the removal area were sprayed with 0.5% chlorine solution by another HCW in full PPE, from the clean area, at a 1.5 m safe distance. Outer surfaces of goggles, elastomeric face masks (after removing and discarding filters), and PAPR hood and motor unit were disinfected with wipes dampened with 0.5% chlorine. Once doffed, goggles, face masks, and PAPR hood; breathing tube; and waist belt were immersed fully in 0.5% chlorine for a minimum of 30 minutes and were then thoroughly rinsed with water to remove irritating hypochlorite residues before reuse. No breaches in the disinfection SOPs were notified, and no transmission of Ebola virus occurred among HCWs caring for the 2 patients with EVD.

However, we noted some critical points in PAPR components disinfection. A large PPE removal area for drying of components is needed; during the PPE doffing, the detachment of each component takes time and needs good practice; throughout chlorine spraying, care should be taken to prevent liquid from entering the air outlet; and finally, the motor unit cannot be immersed in 0.5% chlorine solution.

We believe the safety concerns on PPE disinfection warrant further investigation, and public health officials, scientists, and clinicians fighting emerging infectious diseases should keep close collaboration with manufacturers to improve the response to present and future epidemics.

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Disinfection of reusable elastomeric respirators by health care workers: A feasibility study and development of standard operating procedure

To the Editor:

We thank the authors for their comments about disinfection of medical equipment with chlorine. In contrast with our work, they engaged a small number of staff in extensive training to prepare for safe handling of a small number of highly contagious patients with Ebola virus disease. They do not present their standard operating procedure, but they state that they used bleach solutions with a chlorine concentration of 5,000 ppm, as recommended by the World Health Organization. In contrast with their program, which relied on extensive training of personnel, our work was aimed at developing a standard operating procedure to be used in the event of a pandemic of respiratory illness, especially influenza. Anticipating a large surge of patients, and the possibility of very limited staffing caused by illness among health care workers, we aimed to develop a standard operating procedure that could be deployed with minimal training. We used chlorine concentrations of 50-400 ppm, as recommended by manufacturers of elastomeric respirators. The contrasts between the 2 programs illustrate the range of applications for standard operating procedures to address different clinical needs. We are pleased to learn of the success of their program.

Conflicts of interest: None to report.

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Letter to the editor regarding "The prevalence and influencing factors of methicillin-resistant *Staphylococcus* aureus carriage in people in contact with livestock: A systematic review"

To the Editor:

We thank Liu et al[1] for their meta-analysis on the prevalence of methicillin-resistant *Staphylococcus aureus* (MRSA) carriage among persons in contact with livestock. Although the results are interesting, the extreme heterogeneity ($I^2 = 96.9\%$) makes it questionable whether a pooled prevalence estimate offers a meaningful statistic. The extreme heterogeneity is further demonstrated by the authors' forest plot. Confidence intervals on prevalence estimates above the summary estimate are extremely wide compared with those below the summary estimate. In addition, 2 studies included in the meta-analysis report zero prevalence; 1 study reports 85% prevalence, a considerable disparity. Some results require further explanation. For example, the odds ratio for smoking was significantly <1, suggesting that smoking is protective against MRSA carriage. Based on their

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