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A pandemic influenza preparedness study: use of energetic methods to decontaminate filtering facepiece respirators contaminated with H1N1 aerosols and droplets.

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Abstract

BACKGROUND: A major concern among health care experts is a projected shortage of N95 filtering facepiece respirators (FFRs) during an influenza pandemic. One option for mitigating an FFR shortage is to decontaminate and reuse the devices. Many parameters, including biocidal efficacy, filtration performance, pressure drop, fit, and residual toxicity, must be evaluated to verify the effectiveness of this strategy. The focus of this research effort was on evaluating the ability of microwave-generated steam, warm moist heat, and ultraviolet germicidal irradiation at 254 nm to decontaminate H1N1 influenza virus.

METHODS: Six commercially available FFR models were contaminated with H1N1 influenza virus as aerosols or droplets that are representative of human respiratory secretions. A subset of the FFRs was treated with the aforementioned decontamination technologies, whereas the remaining FFRs were used to evaluate the H1N1 challenge applied to the devices.

RESULTS: All 3 decontamination technologies provided >4-log reduction of viable H1N1 virus. In 93% of our experiments, the virus was reduced to levels below the limit of detection of the method used.

CONCLUSIONS: These data are encouraging and may contribute to the evolution of effective strategies for the decontamination and reuse of FFRs.

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