LETTERS TO THE EDITOR

Hydrogen Peroxide Vapor and Aerosol Room Decontamination Systems

To the Editor—We read with great interest the recent article by Holmdahl et al,[1] "A Head-to-Head Comparison of Hydrogen Peroxide Vapor and Aerosol Room Decontamination Systems," which compared 2 distinctly different hydrogen peroxide vapor systems. The study, as designed, was well executed and obtained results that could be expected on the basis of the methodology employed. We would like to point out to readers and to the study authors some points of methodology that we do not believe are appropriate for this type of study.

There is a basic study assumption that a 6-log kill of spores is the appropriate target for room decontamination. A 6-log kill is definitely appropriate for terminal sterilization of critical medical devices if the devices are used in normally sterile body sites.[2] The goal of room decontamination is significantly different: to eliminate potentially pathogenic microorganisms contaminating room surfaces.

The Holmdahl et al[1] study used biological indicators with a 6-log concentration of *Geobacillus* spores in a Tyvek pouch. A packaged 6-log biological indicator configuration is appropriate and commonly used for terminal sterilization, but it is not consistent with the goal of room decontamination and presents an unduly high level of challenge. It is our opinion that employing the requirements for terminal sterilization is not appropriate and does not serve the user community well.

Literature and surface sampling performed in hospital rooms with contact plates or swab samples has revealed that real-life contamination of hospital room surfaces after cleaning rarely exceeds a 2-log concentration.[3] Overcoming an unreasonably high challenge (a 6-log concentration of *Geobacillus* spores in a Tyvek pouch) requires a higher than necessary dose and concentration of hydrogen peroxide. Higher doses and concentrations of hydrogen peroxide increase the impact to the environment, compared with that of a process that uses a lower concentration and dose of the same active ingredient.

The Glosair System (formerly Sterinis) uses a 5%–6% concentration of peroxide to reduce the environmental risk yet achieves kill levels consistent with known hospital room bioburden levels. We would be glad to work with the study authors to repeat their testing under conditions more representative of real-world conditions.

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Potential conflicts of interest. The author reports that he is presently employed by Advanced Sterilization Products, which develops and markets equipment for area decontamination. All authors submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest, and the conflicts that the editors consider relevant to this article are disclosed here.

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Reply to Roberts

To the Editor—In his letter, Roberts[1] makes some interesting remarks pertaining to our study,[2] which may initiate an important discussion. We agree with Roberts that "the goal of room decontamination ... is to eliminate potentially pathogenic microorganisms contaminating room surfaces."[1,p.xxx] Indeed, proposed standards for hospital hygiene specify the absence of known pathogens from surfaces as the intended goal of hospital disinfection.[3] One of the systems that we tested is reported not to eradicate pathogens from hospital surfaces and is associated with less than a 6-log reduction in vitro.[4-6] Thus, we believe that a 6-log inactivation of *Geobacillus stearothermophilus* spores as biological indicators is an appropriate target for room decontamination because it correlates with the elimination of pathogens.[7]

Roberts[1] makes the point that the concentration of contamination on hospital surfaces is usually in the 2-log range. It would be expected, therefore, that the 2 systems would eradicate pathogens from surfaces, because they achieve a higher log-reduction in vitro than the concentration of contamination typically found on hospital surfaces.[4,6] However, this is not always the case.[4-6] There could be several reasons