

## Effects of contact time and concentration on bactericidal efficacy of 3 disinfectants on hard nonporous surfaces

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### ABSTRACT

This study evaluated three disinfectants, including AHP<sup>®</sup>, against *Staphylococcus aureus* and *Pseudomonas aeruginosa* at a variety of off-label contact times and concentration. Invariably, reduced contact times and concentrations resulted in reduced efficacy in all disinfectants, highlighting the importance of adhering to label directions.

### BACKGROUND

In real-world healthcare environments, it can be difficult to ensure that disinfectant label directions are always followed. Little is known about the effects of off-label use on disinfectant efficacy. The objective of this study was to determine the effect of off-label contact times and concentrations on the efficacy of three disinfectants on hard, non-porous surfaces.

### STUDY

The three disinfectants tested were:

- Oxivir Five 16 concentrate, formulated with Accelerated Hydrogen Peroxide<sup>®</sup> (AHP<sup>®</sup>) in concentrate form, diluted at 1:16
- Virex II 256, formulated with quaternary ammonium compounds (Quats), diluted at 1:256
- Clorox germicidal bleach, formulated with sodium hypochlorite, diluted at 1:32

Each disinfectant was tested for efficacy against *S.*

*aureus* and *P. aeruginosa* on stainless steel coupons at room temperature. Each disinfectant was tested at six different contact times (1,2,3,4,5, and 10 minutes), as well as at eight different concentrations (25%, 50%, 75%, 100%, 125%, 150%, 175%, and 200% of label-indicated concentrations).

### RESULTS

All disinfectants were significantly less effective at reduced contact times. Specifically, AHP<sup>®</sup> achieved a 56.8% reduction in *S. aureus* at a one-minute contact time, compared to the 100% reduction achieved at the label-indicated five minutes. The Quat disinfectant achieved a 100% reduction in *S. aureus* at its label-indicated 10-minute contact time, but after five minutes achieved only 82.9%, and after four minutes, 42.8%.

All disinfectants were significantly less efficacious at reduced concentrations. AHP at 25% and 50% of label-indicated concentrations achieved reductions in *S. aureus* of 40.9% and 75.7% respectively, compared to 100% at full strength.

### CONCLUSION

Overall, sodium hypochlorite was most tolerant to changes in contact time and concentration. Conversely, the Quat product was least tolerant to these changes. This study reinforces the importance of adhering to label requirements when using disinfectants.

## IMPLICATONS FOR AHP®

First and foremost, this study emphasizes the need to adhere to label requirements when using AHP®- based products. But this study also gives us an opportunity to communicate the value of AHP®'s relatively short contact time. The Quat product required the full 10 minutes indicated on the product label to achieve 100% efficacy, which shows that it cannot compete with AHP®'s five-minute contact time in an off-label application. While contact time may not always be top of mind for our users, the data generated in this study demonstrate the effect of failing to meet the conditions indicated on the product label.

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## REFERENCE

Hong Y, Teska PJ, Oliver HF. (2017). Effects of contact time and concentration on bactericidal efficacy of 3 disinfectants on hard non-porous surfaces. *Am. J. Infec. Control.* 45: 1284-5.