

Application of a Continuously Active Antimicrobial Surface Coating in Two Professional Sports Training Facilities

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Background:

The role of surface contamination in infections is of interest in healthcare as well as other industries, especially where infections incur high cost. One such industry is professional sports, where infections pose significant risk to players and the organizations that employ them. Sports training facilities experience highly variable occupancy rates due to differing seasonal activities, presenting a measurement challenge because the relationship between occupancy and surface contamination is not well-described. In a recent publication, a continuously active antimicrobial (CAA) surface coating demonstrated a reduction in bacterial bioburden in ICUs alongside a reduction in Healthcare Associated Infections (HAIs). The present study investigates the impact of a CAA Surface Coating on bioburden on two professional sports training facilities, despite changes in occupancy.

Methods:

A CAA surface coating was applied using an electrostatic sprayer to all surfaces in both facilities, during a period of high-occupancy at Facility A and low-occupancy at Facility B. Surface cultures were taken using 3M™ Sponge-Sticks from lockers, gym equipment and physiotherapy surfaces before treatment, 4-13 weeks post-treatment at Facility A and 4-23 weeks post-treatment at Facility B. Total aerobic bacteria counts were obtained by plating on Tryptic Soy Agar and geometric means of aerobic plate counts (APC) were used to compare bioburden pre- and post-treatment at both facilities, and an out-of-efficacy period at Facility B (17-23 weeks). Occupancy rates were monitored as person-days per week (pd/w) over the course of the study.

Results:

APC counts at Facility A decreased 61% (585 cfu/100cm² to 226 cfu/100cm²) while occupancy increased 3.5% from baseline to post-treatment (165 pd/w to 171 pd/w). At Facility B, a 6% increase in APC was observed (76 cfu/100cm² to 80 cfu/100cm²), although occupancy increased >13,000% during the treatment period (3 pd/w to 386 pd/w). However, at Facility B, during the out-of-efficacy period, total bacteria increased 170% (217 cfu/100cm²) compared to the treatment period, while the occupancy decreased 14% (344 pd/w).

Conclusions:

Levels of bioburden were significantly impacted by the application of the CAA surface coating, especially considering the variation in occupancy in both facilities before, during, and after the efficacy period. During the withdrawal period at Facility B, occupancy rates decreased while bioburden increased significantly, demonstrating the ability of the surface coating to reduce bioburden levels despite significant increases of occupancy. The relationship between human occupancy and bioburden warrants future study, as well as the effect of the CAA surface coating in other industry applications.