Diversity of Bacterial Communities of Fitness Center Surfaces in a U.S. Metropolitan Area  

Abstract  
Public fitness centers and exercise facilities have been implicated as possible sources for transmitting community-associated bacterial infections; however there is a lack of knowledge about the diversity of microbial communities at fitness centers. Microbial load and diversity of the environment are often implicated as a critical indicator of hygiene and cleanliness. Facility cleanliness can be achieved through cleaning and disinfection of environmental surfaces. Accelerated Hydrogen Peroxide® (AHP®) is a proven technology that has demonstrated effectiveness against the commonly found bacteria identified in this study, without compromising user safety.

Background  
As many aspire to stay fit and healthy, many regularly visit fitness centers or gyms. In fact, data indicates a surge in the number of people visiting fitness centers in the last five years. As fitness centers have been implicated as sources for transmitting bacterial infections, an understanding of overall bacterial population and diversity will shed light on the risk of the pathogen propagation from these facilities. The goal of this study was to assess and comprehensively understand the microbial diversity associated with fitness center surfaces; and to determine if different surfaces of fitness centers serve as potential reservoirs for different bacterial communities.

Study  
This study investigated the overall bacterial ecology of selected fitness centers in a metropolitan area utilizing environmental surface swabbing. Surface swabs were collected from four fitness centers. Samples were collected from the skin-contact surfaces on exercise equipment, dumbbell, toilet handles, and handrails on stairs of the fitness centers. The samples were obtained from certain places that had not been sanitized before sample collection.

Results  
Taxonomical composition revealed that the predominant phyla were Firmicutes, Proteobacteria and Actinobacteria. Within these dominant phyla, the bacterial families with the highest relative abundance across all the samples were Bacillaceae, Staphylococcaceae, Enterobacteriaceae, Aerococcaceae, and Microbacteriaceae. In the study the presence of several Staphylococcus spp. was identified in all surface swab samples and were predominately found in power strikers (99.8%), elliptical machines (52.7%), nautilus machines (48%), rails (32.6%), toilet handles (20%), dumbbells (17.7%), treadmills (13.6%), leg presses (6.8%) and stationary bikes (3.7%).

Conclusion  
This study provides a comprehensive assessment on the diversity in bacterial communities in fitness centers along with the knowledge of the potential presence of pathogen organisms. As many of the identified bacteria can be transferred through contact with environmental surfaces, it is critical to underscore the need of proper hygienic practices in fitness centers and gyms for minimizing the spread of disease-causing organisms.

Implications for AHP®  
In fast paced environments that require quick turnover such as fitness centers, AHP® is offered in easy to use formats such as pre-saturated antibacterial wipes and ready-to-use sprays against pathogens of concern such as vegetative bacteria. Furthermore, AHP® leaves no active residues on surfaces which can cause personal safety issues.

AHP® Disinfectants are One-Step Disinfectant Cleaners  
• AHP® has proven cleaning efficiency resulting in lower costs and faster results, with added confidence that disinfection can occur

AHP® Disinfectants provide the perfect balance between safety and efficacy  
• AHP® is designed to be easier on employees and occupants resulting in protocol compliance  
• AHP® antibacterial wipes do not require the use of PPE resulting in increased user compliance

AHP® Disinfectants are environmentally sustainable  
• AHP® active ingredient, hydrogen peroxide, breaks down into water and oxygen leaving no active residues  
• AHP® has been formulated to not negatively impact indoor air quality

AHP® Disinfectants have realistic contact times  
• Short contact times ensure surfaces remain wet for the required contact time, providing comfort and confidence that disinfection has occurred

AHP® Disinfectants are compatible  
• AHP® formulations are tested to ensure compatibility that preserves your investments in equipment, furniture, and building surfaces