Background: Microorganisms exist all around us; everyday, people come in contact with these microbes from a variety of sources. While a majority of these interactions are harmless, sometimes the microorganisms we pick up are more malicious. In a location such as an athletic training facility, these microorganisms can easily leave one host and transfer to another from multiple surfaces, and if these microbes are harmful or pathogenic, disease and sickness can be quick to spread. A 2013 article published by the Journal of Family Practice highlighted the prevalence of skin infections in athletes due to a lack of preventative cleaning practices on commonly shared surfaces (Shah, Cain, Naji, & Goff, 2013). Therefore, proper cleaning and sanitizing techniques are a necessity in order to reduce the chance of disease spreading between clients and staff of these facilities. The purpose of our study was to evaluate effectiveness of cleaning protocols at an Athletic Training facility (Hill Center) at Ithaca College.

Methods: Our protocols were approved by the Institutional Biosafety Committee and the Hill Center Athletic Training Facility Director, Professor Michael Matheny. We performed environmental monitoring using an aseptic swabbing protocol previously described by Chase et al with some modifications (Chase et al, 2016). Sterile cotton swabs immersed in sterile distilled water were swiped onto selected surfaces to collect microbial samples. Swabs were immediately swiped onto plates containing microbiological growth medium (Mueller Hinton). Plates were incubated at 25 degrees Celsius and were analyzed for growth after 24 hours. Unique and representative colonies were Gram stained and viewed microscopically. These colonies were secondarily isolated onto Mueller Hinton agar and were examined via MALDI (matrix assisted laser desorption/ionization) for microbial identification by Dr. Brossard Stoos and collaborators at the Animal Health Diagnostics Center at Cornell University. The surfaces selected for swabbing included: four patient tables, two ultrasound heads, Airex pads, and the rim, side table, and drain of a whirlpool tub. These surfaces were selected by the research team because of their near constant contact with clinic clients and employees. Samples were collected at three time points on three separate days over a one week span during the spring athletic season. All genders were serviced in the clinic during this time. Swabbing commenced prior to clinic opening, during clinic hours, and after clinic closing; times that correlated to shifts where the facilities would be cleaned or used. We hypothesized that swabbing completed prior to clinic opening would yield little microbial growth while swabbing completed during clinic hours and after clinic closure would result in higher yields of microbial growth. Additionally, we expected cultures to yield increased biodiversity both during clinic hours and at closing as compared to swabs collected prior to clinic opening.

Results: Our results showed no significant differences in microbial growth or biodiversity across all time points. The majority of the organisms isolated across all surfaces swabbed at the facility stained as Gram positive cocci (*Micrococcus luteus* a normal skin commensal as most abundant), and Gram positive bacilli secondly. Yeast were isolated from the wet surfaces such as the whirlpool table and whirlpool drain. Swabs taken from tables resulted in growth of mainly *Bacillus megaterium*, a bacterium that is ubiquitous in the environment. Mold and *B. megaterium* were prevalent on the AirEx pads, which are thick foam pads that destabilize footing and challenge the body to maintain balance and stabilize the joints. Based on the part of the body that contacts this equipment and our knowledge of normal human flora, our results are unremarkable. Our data indicate that the microbes isolated from each surface in
the training center originated from human skin flora or environmental sources, none of which are known to cause disease in healthy hosts. We determined that athletes treated in this Athletic Training facility during spring training are not at high risk of exposure to pathogenic organisms. This indicates that the current cleaning protocols in place are effective at reducing risk of transmission of pathogenic microbes from shared facility equipment.

**Works Cited:**
