ElectroClave™ Noncritical Equipment Disinfection Study

Fall 2019

"The CDC Isolation Guideline recommends that noncritical equipment contaminated with blood, body fluids, secretions, or excretions be cleaned and disinfected after use."
CDC Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008

Background:

The rapid adoption of personal and company-owned mobile electronic devices across inpatient and other areas of the hospital is creating new vectors for the spread of infectious pathogens. The partner hospital chose to augment their existing hand-washing protocols with the Seal Shield ElectroClave™ (EC) platform in their Patient Experience department, which sees consistent, daily use of iPads across the hospital. A study was successfully conducted demonstrating that both cleaning and disinfecting their portable electronic devices decreased the risk of microbial colonization, compared to devices that had only been cleaned with a PDI wipe (70% IPA).

Study Design:

The Patient Experience department designated 8 iPads (used daily for rounding purposes) in the study, sampled over 3 days using EnviroTest ET1000 sampling paddles from QI Medical. Laboratory staff collected and analyzed samples with standard protocols. Two of the devices were designated to be the baseline "clean" (PDI wipe + EC) and "dirty" (not wiped, no EC) devices for each day. The remaining 6 devices were targeted as either cleaned and disinfected (PDI wipe + EC) or just cleaned (PDI wipe).

The devices were randomly assigned to participating staff who were following normal infection control procedures while using the devices (gelling in and out, etc.) during their regular rounds. After 4 hours of use, devices were returned and sampled using the sampling paddles. Following a standard 72-hour incubation period, the samples were read for CFU (colony forming unit) counts of any bio matter present.

Additionally, the reporting mechanisms of the EC demonstrated how compliance with disinfection protocols and policies (timeliness) enabled administrative oversight and compliance reporting capabilities. The disinfection compliance log was used to verify independently that the devices had, in fact, been through the required disinfection cycles.

Analysis:

CFU counts were analyzed with a Welch's t-test variance method to identify the significance of variance between the cleaned/disinfected samples and samples that were only wiped (no EC disinfection). Outliers were identified to reveal the influence of unusually high or low counts. The results indicate that a difference existed between samples disinfected with the EC and those that were not (average CFU counts of 16.7 and 39.6, respectively), but with a lower than expected confidence level ($p=0.097$). When the two outlier data points were removed, the confidence level improved to demonstrate statistical significance ($p=0.0001$).

In summary, mobile devices that were disinfected with the EC in addition to being cleaned with the PDI wipes had significantly fewer CFUs than those that were not disinfected with the EC, even with extremely randomized distribution of usage parameters throughout the study. Conclusions included recommendations for additional study involving a greater sample size and controls for more consistent device use.