Methods. This study was conducted in the intensive care unit (ICU) of Yamagata University Hospital, a 637-bed tertiary referral hospital. The ICU has six rooms and beds. In the baseline period (August 2016 to January 2018), all rooms were manually cleaned after every patient transfer/discharge. In the intervention period (February 2018 to February 2019), PX-UV disinfection was added after the manual cleaning. In both periods, all patients were screened for MRSA and two drug-resistant Acinetobacter baumannii (2DRA) to detect acquisition of those pathogens in the ICU. For microbial evaluation, surfaces were selected for sampling by contact plates before/after manual cleaning and after PX-UV. After overnight incubation, colonies on the plates were counted.

Results. The incidence of newly acquired MRSA declined over time (1.40 per 1,000 patient-days in the baseline period to 0.95 in the intervention period, relative risk (RR): 0.68, 95% confidence interval (CI): 0.12–3.70). The incidence of newly acquired 2DRA further declined (4.91 to 1.90, RR: 0.39, 95% CI: 0.13–1.18). Notably, no new acquisition of 2DRA was observed since August 2018 for more than 7 months, not only in the ICU but also throughout the hospital. The total count of colonies in the sampling of 140 sites after 17 patient discharges were 3,540 (before manual cleaning), 669 (after manual cleaning, before PX-UV) and 261 (after PX-UV). The percent reduction of microbiological burden by manual cleaning was 81%, but a further 61% reduction was achieved by PX-UV.

Conclusion. PX-UV is effective in further reducing the microbial burden even after thorough manual cleaning, which presumably led to termination of transmission of 2DRA in our hospital. The effectiveness of PX-UV in controlling MRDROs in the non-US healthcare settings is suggested.

Disclosures. All authors: No reported disclosures.

1215. Ultraviolet-C (UV-C) Monitoring Made Ridiculously Simple: UV-C Dose Indicators for Convenient Measurement of UV-C Dosing
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Background. Ultraviolet-C (UV-C) light is increasingly used as an adjunct to standard cleaning in healthcare facilities. However, most facilities do not have a means to measure UV-C to determine whether effective doses are being delivered. We tested the efficacy of 2 easy-to-use colorimetric indicators for monitoring UV-C dosing in comparison to log reductions in pathogens.

Methods. In a laboratory setting, we exposed methicillin-resistant Staphylococcus aureus (MRSA) and Clostridium difficile spores on steel disk carriers with or without an organic load (5% fetal calf serum) to UV-C for various times resulting in fluence exposures ranging from 10,000 to 100,000 µJ/cm². The UV-C indicators were placed adjacent to the carriers. Log reductions were calculated in comparison to untreated controls and the change in color of the indicators was correlated with dose and log reductions.

Results. The UV-C doses required to achieve a 3-log reduction in MRSA and C. difficile were 10,000 and 46,000 µJ/cm², respectively. For both indicators, there was a visible color change from baseline at 10,000 µJ/cm² and a definite final color change at 46,000 µJ/cm² (Figure 2). Organic load had only a modest impact on UV-C efficacy. The indicators required only a few seconds to place and were easy to read (Figure 2).

Conclusion. UV-C doses of 10,000 and 46,000 µJ/cm² were required to achieve 3 log reductions of MRSA and C. difficile spores, respectively. The colorimetric indicators provide an easy means to monitor UV-C dosing.

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1216. A Novel Antimicrobial Surface Coating Demonstrates Persistent Reduction of both Microbial Burden and Healthcare-Associated Infections at Two High-acuity Hospitals
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Background. Healthcare-Associated Infections (HAIs) pose substantial risks to patients and hospitals. Surface disinfection practices in hospitals have limited efficacy because surfaces are frequently and easily re-contaminated. A need for innovative technologies to address these challenges exists. One such innovation is a novel antimicrobial surface coating that has the potential to persistently reduce environmental bacterial load. Here, we use a multicenter, nonrandomized, controlled, pre-post study design to assess the impact of an antimicrobial surface coating on environmental bioburden and HAIs at two high acuity hospitals.

Methods. An antimicrobial surface coating was applied via electrostatic spray to patient rooms and common areas in three selected units at each hospital. Quantitative surface cultures were sent to an independent microbiology laboratory pre- and 11-weeks post-application to identify total bacterial colony-forming units (CFU). HAI outcomes from treatment and contemporaneous control units were assessed using National Healthcare Safety Network protocols for multidrug-resistant organism bloodstream infections (MDRO-BSI) and Clostridium difficile infections (CDI). We used Poisson regression models to compare HAI rates for treated and untreated units for 12 months before and after application of surface coating.

Results. Both hospitals showed statistically significant decreases in total bacterial CFU following application of the antimicrobial surface coating (64% and 75% decreases in Hospitals A and B, respectively, P < 0.0001). Across both hospitals, there was a 36% decline in pooled HAIs (hospital-onset MDRO-BSI + CDI) following application of surface coating in treated units (IRR = 0.64, 95% CI = 0.44–0.91), and no decline in HAIs over the same period in nontreated units (IRR = 1.20, 95% CI = 0.92–1.55).

Conclusion. Significant and persistent reductions in both microbial burden and associated HAIs occurred in units where surfaces were treated with antimicrobial surface coating, suggesting the potential for improved patient outcomes and reduced healthcare costs. Optimal implementation methods and long-term impact should be assessed with further study of this novel environmental control intervention.

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1219. Disinfection of Surfaces Contaminated with Carbapenemase Producing A. baumannii Using Ozone Under Complex Room Conditions

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Background. Acinetobacter baumannii is an emerging multidrug resistant Gram-negative rod, which has caused multiple hospital outbreaks. A. baumannii can display a high ability to survive on inanimate surfaces. Therefore, cleaning and disinfection is an important part in the prevention of A. baumannii transmission.

Methods. A Carbapenemase-producing A. baumannii outbreak strain was analyzed with respect to its ability to survive on dry surfaces. The Sterisafe™ pro instrument was used in a patient room with an attached bathroom. The A. baumannii strain was dried on three different carriers (ceramic tiles, stainless steel, solid core furniture board) and placed at eight different positions in the rooms. A standard disinfection cycle (80 ppm ozone; 90% RH; 60 minutes) was conducted in three independent experiments.

Results. The A. baumannii strain displayed a long-term survival on surfaces under dry conditions sufficient for further disinfection experiments. Interestingly, the mean reduction rates of A. baumannii dried on three surfaces displayed significant differences. Reduction rates greater than 5 log were reached on all stainless steel and ceramic carriers under even the complex room conditions using the standard disinfection cycle of the Sterisafe™ pro instrument. In contrast, on furniture board individual carriers displayed reduction rates of even less than 4 log. The mean reduction rate was still 5 log for A. baumannii on furniture board.

Conclusion. A. baumannii dried on different surfaces display a differential susceptibility against automated ozone disinfection. However, the Sterisafe™ pro instrument displayed a sufficient reduction of A. baumannii for all tested surfaces even under complex room conditions. The individual behavior of A. baumannii on different materials indicates the necessity for the validation of automated room decontamination systems under varying conditions.

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1220. Effective, Novel, Handheld, UV Technology for Surface Disinfection While Patients or Staff Are Nearby

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Background. The battle against nosocomial infections is ongoing, and the role the environment plays in these infections has been well established. Because only 50% of the items in a patient's room are adequately cleaned at the time of discharge, many hospitals are turning to "no-touch" systems to supplement their manual cleaning and disinfection protocols. Lumagenics introduces a safe, novel, handheld, low heat-generating Cool UV™ technology that can be used on a daily basis, while the patient is in the room.

Methods. Templates were drawn on Formica surfaces and inoculated with known amounts of epidemiologically important pathogens (EIP's) (i.e., MRSA, VRE, CRE Klebsiella pneumoniae, multidrug-resistant Acinetobacter baumannii, and Clostridioides difficile spores). After drying, each surface was exposed to the Cool UV™ at varying times and distances. After exposure, each surface was cultured with a Rodac plate and incubated according to standard microbiological procedures. Following incubation, all growth was quantitated and log, reductions were calculated.

Results. Without an organic load, vegetative EIP's were reduced by an average of 3.63–5.08 log for 1 and 5 sec., respectively, at 1 inch and by an average of 2.10–4.08 log for 1 and 5 sec., respectively, at 5 inches (Table 1). A. difficile spores were reduced by an average of 1.84–3.18 log in 10–60 secs from a distance of 1 inch, and an average of 1.21–2.58 log at 5 inches (Table 2). With an organic load (10% fetal calf serum), the log, reduction for C. difficile spores was reduced ~0.94 log, but the reduction achieved for the vegetative EIP's remained relatively unaffected.

Conclusion. Lumagenics' Cool UV™ technology, with short exposure times, reduced EIP's by levels similar to "no touch" room disinfection UV devices and may be a useful adjunct to daily cleaning and chemical disinfection.

Table 1. Log Reduction of Epidemiologically Important Pathogens Exposed to Cool UV™ Technology

| Pathogen | Log Reduction | 1 inch | 5 inches |
|----------|---------------|--------|---------|
| MRSA     | 6.0           | 5.11   | 3.37    |
| VRE      | 3.11          | 0.60   | 0.06    |
| E. coli  |               | 4.63   | 4.88    |
| K. Pneumoniae |     | 2.77   | 3.19    |
| H. Influenzae |   |        |         |
| MRSA     | 2.90          | 4.44   | 1.03    |
| 30% Fetal Calf Serum |
| MRSA     | 6.40          | 5.32   | 3.28    |
| VRE      | 4.14          | 4.98   | 2.18    |
| E. coli  |               | 4.73   | 4.57    |
| K. Pneumoniae |     | 3.47   | 4.72    |
| H. Influenzae |   |        |         |
| MRSA     | 3.88          | 4.11   | 1.44    |
| 100% Fetal Calf Serum |

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