1146. Effectiveness of Ultraviolet Irradiation on Candida auris: A Laboratory Study

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Background. Candida auris is a multidrug-resistant yeast which persists on healthcare surfaces for prolonged periods of time and is an emerging pathogen in hospitals. It has been linked to healthcare-associated infection (HAI) through surface transmission. Mobile ultraviolet (UV) light emitting devices from mercury sources have been shown to be effective in reducing C. auris bioburden but require prolonged exposure. In this study, we demonstrate the efficacy of an UV emitting device used in our hospital for terminal disinfection on C. auris.

Methods. Two C. auris strains (AR-381-CAU-01 and CAU-02) isolates obtained from Centers for Disease Prevention and Control (CDC) were used along with a Candida albicans (C. albicans) strain. An organism load of 10 μL containing 10^6 colony forming unit (CFU) was spread on a 20-mm diameter stainless steel coupon and exposed to the UV source from a pulsed xenon device at 5 feet distance and 4 feet height for 5, 10, and 30 minutes. Killing efficacy in terms of log reduction was calculated in comparison to untreated control coupons.

Results. Mean CFU log reduction for C. albicans, CAU-01, and CAU-02 was 0.547, 1.051, and 0.932 at 5 minutes; 1.412, 1.975, and 1.887 at 10 minutes; and 2.639, 3.971, and 4.145 at 30 minutes, respectively. Figure 1 describes the mean log reduction as well as the minimum and maximum log reduction by isolates.

Conclusion. Our study demonstrates the UV from a pulsed xenon device is effective in reducing the C. auris on stainless steel coupons. Similar to previously published reports of reduction of C. auris by other UV sources, extended exposure is required to achieve a higher log reduction of C. auris. We did not have any C. auris clinical infections to assess efficacy of UV on HAI reduction.

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1147. Pseudo-Outbreak of Clostridium paraputrificum Related to Anaerobic Tent Contamination

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Session: 135. Healthcare Epidemiology: Environmental and Occupational Health Friday, October 5, 2018: 12:30 PM

Background. Over a 2-month period, eight patient cultures in our clinical microbiology laboratory were positive for Clostridium paraputrificum, an uncommon spore-forming microbe. The possibility of a pseudo-outbreak related to contamination in the laboratory's anaerobic tent was considered.

Methods. This study occurred at a 505-bed tertiary care university-affiliated teaching hospital. Patient samples were cultured and evaluated following standard protocols, and isolates of C. paraputrificum were identified using matrix-assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF MS). To identify additional cases, MALDI-TOF MS testing reports were manually reviewed and matched to patient records. Concurrently, the laboratory’s anaerobic tent was sampled after cleaning with isopropyl alcohol (and later with bleach or sporicidal disinfectant) following standard procedures and protocols recommended by the tent manufacturer (Con). Pulsed-field gel electrophoresis (PFGE) was performed on isolates from patients (n = 8) and the anaerobic culture. Thus, we sought to decide the efficacy of photo-catalyst antimicrobial coating in reducing MDRO acquisition rate after photocatalyst antimicrobial coating. (hazard ratio, 0.37; contamination. Prior to this, six of the eight patients received antibiotics related to this positive culture and had Infectious Disease consultations. Providers of the patients were contacted regarding the contamination issue. The anaerobic tent manufacturer was consulted and ultimately recommended using Peridox Sporicidal Disinfectant. Six months later, the tent was re-sampled and did not yield positive cultures.

Conclusion. A pseudo-outbreak of the uncommon organism C. paraputrificum was related to insufficient disinfection practices of an anaerobic culture tent. This had negative effects on our institution and patient care in terms of cost, time, and unnecessary treatment. The use of sporicidal disinfectant has since proven effective to prevent contamination from spore-producing microbes.

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1148. Reduction of Blood Culture Contamination Rates by an Altered Sampling Protocol: Single-Center, Prospective, Randomized, Controlled, Open-Label Trial

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Session: 135. Healthcare Epidemiology: Environmental and Occupational Health Friday, October 5, 2018: 12:30 PM

Background. Contaminated blood cultures remain a challenge for patients, physicians, and microbiology laboratories, often leading to unnecessary antibiotic treatment. One approach to reduce contamination is to avoid culturing the initial blood sample that can contain a contaminated plug of skin from the needle stick. Initial specimen diversion technique (ISDT) was associated with decreased rate of blood culture contamination when applied in hospitalised phlebotomists. Using vacuum blood collection tubes or a designated device. The aim of this study was to test ISDT in real-life, using externally nonsterile regular vacuum sample tubes for the diversion, by any medical personnel taking blood cultures.

Methods. Adults from whole hospital, the treating physician planned to take blood cultures and additional blood chemistry tests, in the same venous puncture, were eligible and were randomly assigned to intervention or control arms. The hospital's standard protocol for blood drawing was maintained, except that in the intervention arm, blood was aspirated to a green-capped tube, which was used for regular biochemistry tests, prior to the blood culture.

Results. Four hundred twenty-three blood cultures were obtained from 404 patients. Of 404 (11.1%) of the blood cultures, 45 yielded microbial growth, with 31 (7.7%) regarded as true pathogens and 14 (3.5%) as contaminants. Detection of true bloodstream infection was similar by the two methods, 16/181 (8.8%) with the ISDT, and 15/223 (6.72%) using the standard method. The ISDT was associated with a significantly less isolation of presumed contaminants compared with the standard method; 2/165 (1.2%) vs. 12/208 (5.76%), P = 0.02.

Conclusion. ISDT, by any medical personnel, through altered order of test tube vs. blood culture sampling significantly reduced contamination of blood cultures without loss of diverted blood.

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1149. Environmental Disinfection With Photocatalyst as an Adjunctive Measure to Control Multidrug-Resistant Organisms Transmission: A Prospective Cohort Study in High Incidence Setting

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Session: 135. Healthcare Epidemiology: Environmental and Occupational Health Friday, October 5, 2018: 12:30 PM

Background. Hand hygiene and isolation precaution are often difficult to sustain, requiring additional measure to control multidrug-resistant organisms (MDRO) transmission. It was suggested that continuously antimicrobial surfaces could offer superior control of contaminated biofilms, thus, we sought to decide the efficacy of photocatalyst antimicrobial coating in reducing MDRO acquisition in high incidence setting.

Methods. At an institute where used to have high incidence rate of methicillin-resistant Staphylococcus aureus (MRSA), we performed prospective cohort study involving patients hospitalized in medical intensive care unit. Five months of intervention (where routine infection control measures were maintained) data were compared with 5 months of postintervention (after titanium dioxide-based photocatalyst were coated on high touch surfaces) data. The acquisition rate of MDROs and the rates of hospital-acquired blood stream infection (HABI), pneumonia, urinary tract infection (UTI), and Clostridium difficile-associated disease (CDAD) were compared using Cox proportional hazards regression analysis.

Results. A total of 621 patients were included. There was significant decrease in MRSA acquisition rate after photocatalyst antimicrobial coating. (hazard ratio, 0.37;
95% CI, 0.14–0.99; P = 0.04). However, acquisition rates of vancomycin-resistant Enterococcus spp. and multidrug-resistant Acinetobacter baumannii had not significantly decreased. The hazard of acquiring hospital acquired pneumonia during intervention period compared with baseline period was 0.46 (95% CI, 0.23–0.94; P = 0.03). There were not significant reduction in hospital acquired BSI, UTI, and CDAD, after photokillant antimicrobial coating.

Conclusion. MRSA acquisition rate and hospital acquired pneumonia were significantly reduced after photocatalyst antimicrobial coating. This study provides evidence that photocatalyst antimicrobial disinfection can be an adjunctive measure to control MRSA acquisition in high incidence setting.

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1150. Cleaning High Touch Surfaces of Patients’ Rooms: Make It Easier, and It Simply Gets Cleaner

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Session: 135. Healthcare Epidemiology: Environmental and Occupational Health
Friday, October 5, 2018: 12:30 PM

Background. The healthcare environment has been established as a reservoir for human pathogens and specifically multidrug-resistant organisms (MDRO). High touch surfaces and fomites in a patient's room mediate transmission between infected and uninfected patients and personnel. Efforts to reduce hospital-associated infections due to MDROs often focus on room cleaning; however, adherence to and thoroughness of cleaning pose significant challenges.

Methods. A crossover trial was implemented in January 2016 (for 15 months) at Assaf Harofeh Medical Center (Israel) in four identical medical units. Single-use wipes (Clinell®; universal wipes and sporidical wipes for rooms of patients with C. difficile), were compared with common practices which consisted of reusable cloths and bleach (1,000–5,000 ppm). Six-month cleaning and intervention periods were used on units in alternating sequences, separated by washout periods. Cleaning was monitored twice a week (bedrail, bedside table, clinical binder, call button, and lamp switch), by a fluorescent escence marker system (Clinell®). Comparisons used GEE with clustering for room. Staff were surveyed on intervention feasibility, acceptability, and satisfaction.

Results. Complete cleaning in all five test locations was found in 23% of 400 total assessments and was more common in the intervention group (34% vs. 12%; OR = 3.7; P < 0.001). Using adherence was highest for the bed rail (71%) and lowest for the call button (38%). The universal wipes had the largest effect on adherence for the light switch (59% vs. 26%; OR = 4.2; P < 0.001). Intervention timing was not associated with overall adherence (P = 0.10). 94% of staff reported overall satisfaction of “very good” or “excellent,” and 96% of staff reported that use of the wipes shortened the cleaning process.

Conclusion. The use of cleaning wipes resulted in greater adherence to room cleaning and the method was reported to be acceptable to staff. Future aims of this large study (over 10,000 patients were enrolled and data collection not yet completed) are to determine the impact of this intervention on rates of hospital-acquired infections, MDRO acquisition and mortality.

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1151. A Safer, More Effective Method for Cleaning and Disinfecting GI Endoscopic Procedure Rooms

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Session: 135. Healthcare Epidemiology: Environmental and Occupational Health
Friday, October 5, 2018: 12:30 PM

Background. Healthcare acquired infections are increasing. Current cleaning and disinfecting (C&D) methods subject staff to toxic chemicals and can be damaging to the fabric and physical health (HOCl) is a disinfecting solution that is 80–200 times more effective than bleach in surface disinfection of bacteria yet is nontoxic to humans.

The aim of this study was to determine whether HOCl is as effective as standard cleaning methods for GI ambulatory surgery center (ASC) rooms as determined by ATP (adenosine triphosphate) measurements over a 2-week period.

Methods. Two similar GI ASCs, each with two procedure rooms, were studied. One ASC received postprocedure STANDARD C&D with quaternary ammonium disinfecting results.

Figure 1.

B. Overholt, HOCl Solutions: Shareholder, none to date.

1152. Leveraging Human Factors Engineering to Optimize Low-level Disinfection of Redesigned Medical Tools

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Session: 135. Healthcare Epidemiology: Environmental and Occupational Health
Friday, October 5, 2018: 12:30 PM

Background. Inadequate cleaning and disinfection of shared medical equipment can lead to healthcare-associated infections and outbreaks. Stethoscopes were identified as the most commonly used piece of shared equipment at our institution, but cleaning practices were inconsistent among providers. We aimed to assess provider attitudes and practices around stethoscope disinfection and to subsequently implement a test of change (TOC) supported by human factors observations to improve cleaning consistency and frequency.

Methods. We conducted an anonymous electronic survey via SurveyMonkey paired with human factors observations in a free-standing children’s hospital. We surveyed physicians, nurses, and advanced practice providers to identify barriers to regular stethoscope cleaning. Quantitative results, human factors observations, and workflow simulations on a single unit were used to design an intervention to standardize low-level disinfection. Small mesh baskets holding alcohol prep pads labeled with brightly colored signage were installed by the exit of each patient room on one trial unit. Following implementation, a post-survey and direct observations on the unit were conducted.

Results. Of those surveyed healthcare providers who completed the pre-survey (n = 38), 33% believed stethoscopes pose a high infection risk to patients. However, only 38% of respondents reported cleaning their stethoscope between patient encounters. The most cited barrier to cleaning was a lack of easily accessible cleaning product (49%). After the unit-based TOC, alcohol from baskets were utilized by 80% of the 25 surveyed providers. The reported increased frequency of cleaning due to accessibility. Additionally, the brightly colored signage was a visual cue to disinfect equipment. Increased satisfaction of families reinforced the behavior. Direct observations revealed an increased frequency of cleaning while qualitative interviews elicited increased awareness from staff.

Conclusion. Leveraging human factors engineering to inform the placement and design of easily accessible disinfection supplies correlated with increased frequency of stethoscope cleaning by healthcare providers. Future steps include implementation in all inpatient care areas.

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