Results. There was no difference in ABC count for hydrogen peroxide and sodium hypochlorite 10% between the different categories of cleaning time. For quaternary ammonium compound and soap and water, the limited cleaning time category showed lower ABC counts than the unlimited time categories for samples taken from isolation rooms, P = 0.009. For 150 soap and water samples, 61 showed an increase in ABC count from the pre-clean sample to post-clean sample.

Conclusion. Cleaning time was not related to post-clean ABC count for sodium hypochlorite 10% or Hydrogen Peroxide. Limited cleaning time was more effective in lowering ABC counts for quaternary ammonium compound and for soap and water. For soap and water, post-clean ABC counts were actually higher than pre-clean ABC counts for numerous samples. This may be due to the spreading organisms across the surface while cleaning, without adequate disinfection.

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498. Contaminated Re-usable Thermometers Are a Potential Vector for Dissemination of Pathogens

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Background. Portable medical equipment that is shared among patients may become contaminated with healthcare-associated pathogens, and cleaning of these devices is often suboptimal. Limited data are available on the potential for contaminated equipment to serve as a vector for pathogen dissemination. However, previous studies have suggested that the handles of re-usable thermometers may transmit pathogens.

Methods. We used a DNA marker generated from cauliflower mosaic virus to study the potential for dissemination of pathogens by re-usable thermometers which are attached to the portable vital signs equipment used on a long-term care facility (LTFCF) ward. The DNA marker was inoculated onto 6 thermometer handles. During a 24-hour period, radio-frequency identification (RFID) technology was used to monitor movement of the equipment and fluorescent markers were used to assess whether the equipment was cleaned. Polymerase chain reaction was used to determine whether the DNA marker contaminated high-touch surfaces in patient rooms, other portable equipment on the ward, and common areas.

Results. Portable vital signs equipment entered 14 LTFCF resident rooms during a 24-hour period. The DNA marker was detected on high touch surfaces in 3 of the 14 (21%) rooms and on 4 other items of shared portable equipment, but not in common areas. There was no evidence that the portable equipment was cleaned based on absence of removal of the fluorescent marker.

Conclusion. Our findings demonstrate the potential for contaminated shared portable equipment such as re-usable thermometers to serve as a vector for dissemination of pathogens in the LTFCF setting. There is a need for effective strategies to disinfect shared portable equipment between patients.

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499. Frequent Contamination of Healthcare Worker Scrubs

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Background. Pathogens responsible for healthcare-associated infections (HAI) can be spread from patient-to-patient via healthcare worker (HCW) hand, clothing, and other fomites.

Methods. We performed a cohort study of HCWs in critical care areas to assess factors associated with bacterial contamination of scrubs. Participants were given one set of new, study-issued scrubs along with a randomized schedule of wear at the start of the study. During an 8-month study period, each scrub set was sampled eight times, on random days and at least 4 hours into a shift. Sampling of scrubs was with pre-moistened cotton swabs in a W-shape over the front of the scrub top and along both thighs, as well as RODAC agar plate stamped over the near the belly button. A brief survey tool was used to identify risk factors for contamination at the time of sampling. Total colony count and the presence of pre-specified, pathogenic bacteria (Staphylococcus aureus, Enterococcus or Gram-negative bacteria) were assessed. Generalized estimating equation (GEE) was used to identify factors associated with bacterial contamination.

Results. A total of 720 scrub samples were obtained from 90 HCW; 30% (217/720) of scrubs were contaminated with pathogenic bacteria. The mean (standard deviation) log colony count of the sampled scrubs was 3.9 (1.1). On sampling days, HCWs reported average, primary care of 2.4 patients and interaction with 5.4 patients. Multivariate analysis showed that providing care for patients with wounds was associated with scrub contamination of pathogenic bacteria (OR 1.75, 95% CI: 1.17–2.62). The average log colony count was higher among HCWs who gave a patient a bath (log CFU difference = 0.21, P = 0.05). Bacterial contamination was lower among HCWs assigned to care for at least one patient on Contact Precautions (CP) (log CFU difference = 0.28, P < 0.01).

Conclusion. HCW attire is frequently contaminated with pathogenic bacteria. Contamination is associated with providing care for patients with wounds and giving a bath; while contamination is lower when caring for patients on CP. The later finding supports the use of CP to decrease potential risk of transmission.

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491. Likelihood of Environmental Contamination of Patient Rooms in Six Acute Care Facilities Based on Facility, Unit-Type, and Precautions Status

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Background. Environmental contamination may play a critical role in ARO (antibiotic-resistant organism) transmission. The objective of this study was to estimate facility/unit contamination in 6 healthcare facilities and determine if differences existed among facilities, unit types, and room contact precautions status.

Methods. In each facility, two units with patients with a recent positive test of a target ARO (MRSA, VRE, or carbapenem-resistant Gram-negatives in the previous 6 months or 0.01% incidence in the previous 24 months) were randomly selected every 2 weeks for 8 cycles. Within units, surfaces were sampled in all contact precautions rooms of patients with a target ARO, 1–2 randomly selected non-contact precautions rooms per patient with a target ARO, and 1–2 non-contact precautions rooms per contact precautions room, and the nursing station. Multilevel logistic regression was used to model the association of facility/unit with risk of contamination. The inverse of sampling probability was used as weights in the regression.

Results. A total of 196 ARO contact precautions rooms and 221 non-precautions rooms were sampled from 24 units (9 ICUs; 13 acute care medicine/surgical units; 2 transplant units) totaling 1,448 specimens. Of 417 rooms sampled, 23% were positive for one or more of the target AROs. Fourteen percent of non-precautions rooms were positive for one or more of the target AROs, and 17% of ARO precautions rooms were positive for AROs other than the known target ARO. In general, prevalence of environmental ARO contamination did not differ between facilities sampled. Compared with ICUs, odds of contamination on transplant and acute care units were 5.86 and 3.85 times higher, respectively. Of non-precautions rooms and nursing stations were significantly less likely to be contaminated with AROs compared with contact precautions rooms (OR = 0.24, P < 0.001) and (OR = 0.34, P = 0.009), respectively.

Conclusion. Detection of target AROs in non-precautions rooms and at nursing stations suggests colonized patients may be going undetected, cleaning is not sufficiently removing contamination from prior ARO patients, or AROs are being transferred from infected patients to other locations within the unit. Additional intensive sampling may further illuminate priority areas for interventions within acute care facilities.

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492. The Utility of Preliminary Patient Evaluation in a Febrile Respiratory Infection Discharge Unit Outside the Emergency Department

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Background. Acute respiratory illnesses are the leading cause of death from infectious disease globally, and occasional outbreaks of particularly virulent strains are can be public health disasters. Recently, a large outbreak of fatal Middle East respiratory syndrome-coronavirus (MERS-CoV) occurred following a single patient exposure in the emergency department (ED) of the Samsung Medical Center, a tertiary-care hospital in South Korea, which resulted in significant public health and economic burden.

After this outbreak, a febrile respiratory infectious disease unit (FRIDU) with a negative pressure ventilation system was constructed outside the emergency department (ED) in 2015, to screen for patients with contagious diseases requiring isolation.

Methods. This is a retrospective cohort study of patients who visited the ED with febrile illness between August 2015 and July 2016. Ultimately, 1562 patients who were hospitalized after FRIDU screening were analyzed. The level of isolation recommended during their screening at the FRIDU was compared with the level deemed appropriate given their final diagnosis.

Results. Of the 1562 patients screened at the FRIDU, 198 (13%) were isolated, 194 (12%) were reverse isolated, and 1170 (75%) were not isolated. While hospitalized, 97 patients (6%) were confirmed to have a contagious disease requiring isolation, such as tuberculosis, who were consequently during procedures, but was uncommon in the absence of a procedure. Contamination occurred frequently on surfaces touched by personnel during procedures (12 of 38, 32% positive) and on portable equipment used for procedures (25 of 101, 25%). The presence of a wound was the only factor significantly associated with the intervention, with a final diagnosis of MRSA (59% vs. 26%, P = 0.04).

Conclusion. Environmental shedding of MRSA occurs frequently during medical and non-medical procedures in hospitalized patients. Our results suggest that there is a need for effective strategies to disinfect surfaces and equipment after procedures.

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493. Quantitative Assessment of the Bioburden of High-Touch Environmental Surfaces in Pediatric Operating Rooms
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Background. Previous studies have linked healthcare-associated infections to bacterial pathogens in the operating room (OR) environment. The purpose of this study was to determine the bioburden on OR surfaces to guide future quality improvement efforts and optimize OR cleanliness.

Methods. This study was performed in the pediatric ORs of a 200-bed, academically affiliated, children’s hospital with ~6000 general and subspecialty surgical procedures annually. Infection control practitioners performed environmental cultures before and after cleaning.

Results. In all, 364 surfaces were tested. The median RLUs were <250, 250–850, and >850 RLUs for 7, 11, and 6 surfaces, respectively. Of the 24 surfaces tested, all demonstrated bioburden ≥250 at least once. Median RLUs for each surface ranged from 39,228 to median RLUs for each OR ranged from 196 to 1534. The highest bioburden occurred following cardiac surgery (median 1354, range 24-13275 RLU) and the lowest bioburden occurred after neurosurgery (median 196, range 23-2475 RLU). The surfaces with the highest bioburden were the anesthesiologist’s keyboards (median 2282, range 347-38376 RLU) and core door handles (median 1471, range 140-6788 RLU) and those with the lowest bioburden were the Mayo stand (median 39, range 19-765 RLU) and back table (median 39, range 17-406 RLU).

Conclusion. ATP testing demonstrated that most OR surfaces were contaminated with organic material. While OR surfaces prior to cleaning are expected to be contaminated, these data highlight the importance of cleaning/disinfection. These findings are being used to develop educational tools and interventions for the interdisciplinary OR team, which will focus on delineation of cleaning responsibilities, the use of appropriate cleaning products, and audits of end-of-case cleaning and terminal cleaning.

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494. Shedding of Methicillin-Resistant Staphylococcus aureus (MRSA) by Hospitalized Patients during Procedures
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Background. Contaminated environmental surfaces contribute to transmission of healthcare-associated pathogens such as methicillin-resistant Staphylococcus aureus (MRSA). We hypothesized that medical and non-medical procedures facilitate environmental dissemination of MRSA in hospitalized patients.

Methods. We conducted an observational cohort study of hospitalized MRSA-colonized patients to determine the frequency of and risk factors for environmental shedding during procedures. Prior to each procedure, surfaces in the room and portable equipment used for procedures were disinfected. After procedures, high-touch surfaces and portable equipment were cultured; negative control cultures were collected after 1 hour in the absence of a procedure. Bivariate analyses were performed to identify factors associated with environmental shedding.

Results. Of 55 MRSA colonized patients, 22 (40%) had wounds and 25 (46%) had positive skin cultures. Environmental cultures were collected after 138 total procedures (range, 2 to 12 per patient). As shown in the figure, contamination of surfaces occurred frequently during procedures, but was uncommon in the absence of a procedure. Contamination occurred frequently on surfaces touched by personnel during procedures (12 of 38, 32% positive) and on portable equipment used for procedures (25 of 101, 25%). The presence of a wound was the only factor significantly associated with shedding, with a final diagnosis of MRSA (59% vs. 26%, P = 0.04).

Conclusion. Environmental shedding of MRSA occurs frequently during medical and non-medical procedures in hospitalized patients. Our results suggest that there is a need for effective strategies to disinfect surfaces and equipment after procedures.

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495. Successful Environmental Disinfection to Prevention Transmission of Candida Auris
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Background. Candida auris is a globally-emerging, multidrug-resistant yeast causing invasive infections and can persist on environmental surfaces if not adequately disinfected. Last summer, two patients with C. auris infections were admitted at University of Chicago Medicine (UCM). Environmental samples were collected to assess environmental contamination before and after cleaning.

Methods. Environmental samples were collected using 3M Sponge Sticks with neutralizing Buffer during one patient’s stay, weeks after another patient’s stay, and after enhanced terminal cleaning. Samples were cultured directly and yeast was identified using MALDI. The following surfaces were sampled: Bathoom sink drain, bedside table, bedrail, mattress, chair and window ledge. Routine terminal cleaning includes 10% sodium hypochlorite solution applied high touch surfaces of both room and bathroom. The enhanced terminal cleaning process used for these rooms included: (1) 10% sodium hypochlorite solution applied to all high touch surfaces and portable equipment used for procedures; (2) privacy curtains removed and replaced; (3) supervision by environmental services manager; and (4) single UV disinfection cycle in room and bathroom.

Results. Because of delay in identification of C. auris for the first patient, pre-clean terminal samples were taken >2 weeks after the patient had been discharged. During the intervention, multiple patient rooms occupied the room and there had been >1 routine cleaning. None of these samples were positive for C. auris. Pre-clean, in-residence samples indicated C. auris contamination of multiple surfaces for the second patient. Because of transfers within the institution, there are three sets of post-cleaning