



Figure 2.

LHD enables reprocessing of N95s and other PPE using existing assets. LHD is advantageous because of scalability and the capacity to provide staff with their own reprocessed PPE.

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Poster Presentation

Subject Category: Emerging Pathogens

Experience of Treating *Candida auris* Cases at a General Hospital in Qatar

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Background: So far, there have been no studies on *Candida auris* in Qatar. We describe the clinical spectrum and outcome of *C. auris* infection in patients admitted to a general hospital in Qatar. **Methods:** We conducted this descriptive observational study in a general hospital in Qatar. We have included all patients with *C. auris* infection and colonization admitted to a general hospital from December 2018 to August 2019. **Results:** We identified 13 patients with confirmed *C. auris* infection or colonization, of whom 5 cases represented an actual *C. auris* infection, while the remaining 8 cases were considered colonization. The mean age of the patients with infection was 76.6 years (SD, ± 8.4), while the mean age of the patients with colonization was 66.4 years (SD, ± 24.7). Among the individuals clinically infected with *C. auris*, 2 had urinary tract infections, 1 had candidemia, 1 acquired a soft-tissue infection, and 1 had a lower respiratory tract infection. All strains of *C. auris* were susceptible to echinocandins, flucytosine, and posaconazole while resistant to fluconazole and amphotericin B. Of the patients with *C. auris* infection who received systemic antifungal therapy, 3 (60%) died during antifungal therapy. **Conclusions:** Our study showed that *C. auris* can cause a wide variety of invasive infections, including bloodstream infection, urinary tract infection, skin infection, and lower respiratory tract infections, especially in critically ill patients. In addition, our isolates showed resistance to the most common antifungal agents such as fluconazole and amphotericin B.

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Presentation Type:

Poster Presentation

Subject Category: Environmental Cleaning

Engaging Veterans in Identifying Key Elements of Environmental Cleaning: The Patient Perspective

Kelsey Baubie; Linda McKinley; Julie Keating and Rosemary Bartel

Background: Contaminated surfaces in healthcare settings contribute to the transmission of pathogens. Environmental cleaning and disinfection are important for preventing pathogen transmission and reducing healthcare-associated infections (HAIs). Hospital cleanliness plays a large role in patient perception of the healthcare setting and, consequently, of patient satisfaction. However, patient perceptions of environmental cleaning remain unclear. To engage patients as part of achieving patient-centered care, we undertook a qualitative study to examine patient perspectives on environmental cleaning and disinfection in healthcare settings. **Methods:** We conducted semistructured qualitative interviews with 14 hospitalized patients at a large midwestern Veterans' Administration hospital. Interviews were audio recorded, professionally transcribed verbatim, summarized in a "key domains" template developed by the research team, then coded for emerging themes. **Results:** Patients reported feeling satisfied with hospital cleanliness and especially the daily cleaning they observed while hospitalized. Cleaning activities highlighted included mopping and disinfecting high-touch surfaces, bathrooms, and floors. Despite this overall positive response, some patients expressed worries of being "in the way" or burdensome if they were in their rooms while staff were cleaning. One interviewee stated, "It's easier for them if there isn't a patient in [the room] ... it's hard to do any endeavor when you've got a complete stranger watching you." Patients also acknowledged the importance of careful cleaning, especially during the COVID-19 crisis; "It's got to be something you take seriously, especially during this pandemic." Some patients spoke of the relationship which can develop between environmental services staff during daily hospital room cleaning. **Conclusions:** Patient perceptions of environmental cleaning are important to understand and incorporate into clinical practice. Overall, patients felt that their environments were clean, and they expressed confidence in the staff's work. Interviewees additionally spoke of their own self-efficacy, saying they try to clean up after themselves and would feel comfortable speaking up if something needed to be cleaned. However, some patients acknowledged feeling burdensome to the environmental services staff if patients were present in rooms while staff cleaned. Cleaning activities may become more patient-centric if they are better planned (eg, while patient is out of the room) or based on patient preferences on time of day.

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A Qualitative Work System Analysis Using a Human Factors Engineering Approach to Evaluate Environmental Cleaning in Veterans' Affairs Hospitals

Linda McKinley; Cassie Goedken; Erin Balkenende; Stacey Hockett Sherlock; Heather Reisinger; Mary Jo Knobloch; Eli Perencevich and Nasia Safdar

Background: Environmental cleaning is important in the interruption of pathogen transmission and subsequent infection. Although recent initiatives have targeted cleaning of high-touch surfaces and incorporated audit-and-feedback monitoring of cleaning practices, practice variations exist and compliance is still reportedly low. Evaluation of human factors influencing variations in cleaning practices can be valuable in developing interventions, leading to standardized practices and improved compliance. We conducted a work system analysis using a human-factors engineering framework [the Systems Engineering Initiative for Patient Safety (SEIPS) model] to identify barriers and facilitators to current environmental cleaning practices within Veterans' Affairs hospitals. **Methods:** We

conducted semistructured interviews with key stakeholders (ie, environmental staff, nursing, and infection preventionists) at 3 VA facilities across acute-care and long-term care settings. Interviews were conducted among 18 healthcare workers, audio recorded, and transcribed verbatim. Transcripts were analyzed for thematic content within the SEIPS constructs (ie, person, environment, organization, tasks, and tools). **Results:** Within the SEIPS domain 'person,' we found that many environment service (EVS) staff were veterans and were highly motivated to serve fellow veterans, especially to prevent them from acquiring infections. However, the hiring of service members as EVS staff comes with significant hurdles that affect staffing. Within the domain of 'environment,' EVS staff reported rooms that were either occupied by the patient or were multibed, were more difficult to clean. Conversely, they reported that it was easier to clean in settings where the patient was more likely to be out of bed (eg, long-term care residents). Patient flow and/or movement greatly influenced workload within the 'organizational' domain. Workload also changed by patient population and setting (eg, the longer the stay or more critical the patient), increased their workload. EVS staff felt that staffing consistency and experience improved cleaning practices. Within the 'task' domain, EVS staff were motivated for cleaning high-touch surfaces; however, knowledge of these surfaces varied. Finally, within the 'tool' domain, most EVS staff described having effective cleaning products; however, sometimes in limited supply. Most sites reported some form of monitoring of their cleaning process; however, there was variation in type and frequency. **Conclusions:** Human-factors analysis identified barriers to and facilitators of cleaning compliance. Incorporating environmental cleaning practices that address barriers and facilitators identified may facilitate standardized cleaning of environmental surfaces. Standardized procedures for cleaning multibed rooms and environmental surfaces surrounding occupied beds may improve cleaning compliance. Future research should evaluate standardized cleaning procedures or bundles that incorporate these best practices and steps to overcoming barriers and pilot feasibility.

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Subject Category: Environmental Cleaning

Damaged Hospital Mattresses and Bed Frames Are Common in Acute-Care Hospitals

Edmond Hooker

Background: Hospital beds are now high-tech, reprocessable, medical devices. The surface of the mattress (cover) is manufactured using polyurethane-coated fabric to ensure moisture-vapor transmission to prevent pressure ulcers. In recent years, due to multidrug-resistant organisms, healthcare organizations have used increasingly harsh chemicals to clean these mattresses. None of these chemicals are approved for use on polyurethane-coated fabric. Previous research has shown that many mattresses in hospitals are damaged. The US Food and Drug Administration, Centers for Disease Control and Prevention, ECRI, and manufacturers recommend routine mattress inspection and replacement of mattresses with any visible signs of stains, wear, or damage. Damaged mattresses have been linked to fluid leakage, resulting in patient exposure and outbreaks of healthcare-acquired infections. **Methods:** Four hospitals of a midwestern hospital system had all of their mattresses inspected for damage and staining to the mattress. After external examination, each mattress was opened, and the mattress core was evaluated for damage. The cover of each mattress was examined using the naked eye and then using an LED light to demonstrate smaller holes. Each bed frame was examined for evidence of rust, and the amount of rust was recorded. If available, the age of the mattress was determined based on a label on the mattress. **Results:** In total, 727 beds and mattresses were inspected. Of these mattresses, 523 (72%) were damaged. Also, 340 (47%) required replacement of the mattress cover, and 183 (25%) required replacement of the entire mattress (cover and core). For the 209 damaged mattresses (40%) with the date of manufacture label, 156 (75%) were <4 years old. Damage to the mattress included 428 (59%) with

holes in the cover: 113 (16%) were visible to the naked eye and 315 (43%) small holes only detected by using an LED light. Also 173 mattresses (24%) had stains on the exterior cover, 215 (30%) had stains on the interior of the top cover, and 192 (26%) had stains on the interior of the bottom cover. Bed-frame rust was identified on 175 (24%) beds, of which 65 (9%) had widespread rust. **Conclusions:** These findings confirm previous reports that damaged mattresses are common in hospitals and potentially place patients at risk. Most of these failed mattresses are <4 years old, which is much less than the expected life of a mattress and bed deck.

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Using Ultraviolet C (UVC) in Operating Rooms: A Hygiene Improvement

Roberta Bosco; Gabriele Messina; Davide Amodeo; Gabriele Cevenini and Simona Gambelli

Background: Disinfection procedures are an essential aspect of preventing cross contamination, especially in situations where the risk of infection is higher, such as in operating rooms (ORs). Disinfection procedures in ORs at the end of each surgery session are not the same as final cleaning procedures. We assessed the difference in microbial contamination between different levels of disinfection, before T(0) and after T(1) the use of an ultraviolet C device (UVC-D). **Methods:** A cross-sectional study was conducted between December 2019 and August 2020 in a private clinic. Three sanitation levels (SL1–SL3) were compared for the reduction in colony-forming units (CFU) between T(0) and T(1): (1) no disinfection after surgery (SL1); (2) after in-between cleaning (SL2), and (3) after terminal cleaning (SL3). UVC-D was used for 6 minutes, 3 minutes per bed side. Overall, 260 Petri dishes were used in 3 ORs, incubated at 36°C, and CFU were counted after 48 hours. Descriptive statistics, Wilcoxon test, and MANOVA for repeated measures were performed to verify the 95% statistical difference between T(0) and T(1), both on the whole sample and combined with the different SLs. **Results:** The unstratified analysis showed statistically significant differences (Wilcoxon test, $p < 0.05$) between T(0) and T(1), with means and standard deviations of $11.42 \pm SD 41.19$ CFU/PD and $5.91 \pm SD 30.89$, respectively. The Manova test for repeated measures, applied to 54 pairs of measurements, showed no significant difference between SLs in T(0)–T(1) CFU reduction. Overall, the mean percent reduction in CFU was 93.48% (CI95% = 86.97–99.99%). **Conclusions:** The results showed significant improvements in disinfection under any condition tested with UVC-D. Using the device immediately after surgery (SL1), before standard cleaning procedures, reduced CFUs by 97.3%. In some situations, UVC light was sufficient to reduce CFU to zero, even without chemical and mechanical cleaning. However, we do not recommend this approach; UVC light disinfection should be applied only after sanitization procedures because it does not remove dirt.

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Subject Category: Hand Hygiene

Building on the Foundation of a Sustainable Hand Hygiene Program During the COVID-19 Pandemic

Lisa Stancill; Emily Sickbert-Bennett Vavalle and Lauren DiBiase

Background: Hand hygiene is essential to preventing the spread of disease in hospitals. Renewed emphasis has been placed on hand hygiene during the COVID-19 pandemic. We investigated whether UNC Medical Center's