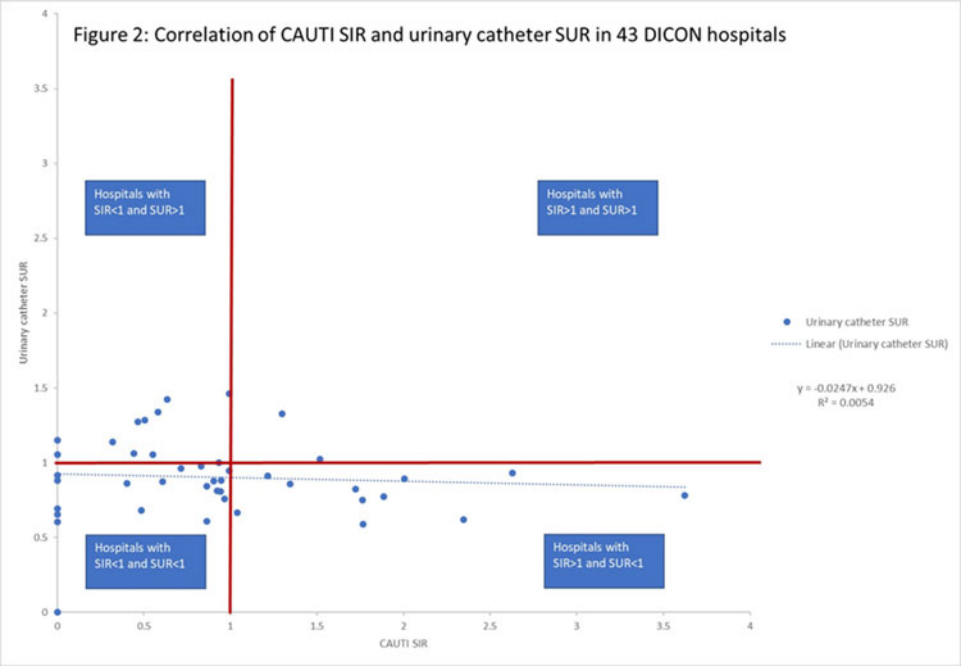

Fig. 2.

hospitals showed a better correlation for CLABSI SIR and SUR (0.37) compared to medium and large hospitals (0.19 and 0.22, respectively). Conversely, smaller hospitals showed no correlation between CAUTI SIR and SUR, whereas medium and larger hospitals showed a negative correlation (−0.31 and −0.39, respectively). **Conclusions:** Our data reveal a weak positive correlation between SIR and SUR for CLABSIs, suggesting that central line use impacts CLABSI SIR to some extent. However, we detected no correlation between SIR and SUR for CAUTIs in smaller hospitals and a negative correlation for medium and large hospitals. Some hospitals with low CAUTI SIRs might actually have higher device use, and vice versa. Therefore, the SIR alone does not adequately reflect preventable harm related to urinary catheters. Public reporting of SIR may incentivize hospitals to focus more on urine culture stewardship rather than reducing device utilization.

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Poster Presentation

Comparison of Respiratory Microbiome Disruption Indices to Predict VAP and VAE risk at LTACH Admission

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Background: Healthcare exposure results in significant microbiome disruption, particularly in the setting of critical illness, which may contribute to risk for healthcare-associated infections (HAIs). Patients admitted to long-term acute-care hospitals (LTACHs) have extensive prior healthcare exposure and critical illness; significant microbiome disruption has been previously documented among LTACH patients. We compared the predictive value of 3 respiratory tract microbiome disruption indices—bacterial community diversity, dominance, and absolute abundance—as they relate to risk for ventilator-associated pneumonia (VAP) and adverse ventilator-associated events (VAE), which commonly complicate LTACH care. Methods: We enrolled 83 subjects on admission to an academic LTACH for ventilator weaning and performed longitudinal sampling of endotracheal aspirates, followed by 16S rRNA gene sequencing (Illumina HiSeq), bacterial community profiling (QIIME2) for diversity, and 16S rRNA quantitative PCR (qPCR) for total bacterial abundance. Statistical analyses were performed with R and Stan software. Mixed-effects models were fit to relate the admission MDIs to subsequent clinically diagnosed VAP and VAE. Results: Of the 83 patients, 19 had been diagnosed with pneumonia during the 14 days prior to LTACH admission (ie, "recent past VAP"); 23 additional patients were receiving antibiotics consistent with empiric VAP therapy within 48 hours of admission (ie, "empiric VAP therapy"); and 41 patients had no evidence of VAP at admission (ie, "no suspected VAP"). We detected no statistically significant differences in admission Shannon diversity, maximum amplicon sequence variant (ASV)–level proportional abundance, or 16S qPCR across the variables of interest. In isolation, all 3 admission microbiome disruption indices showed poor predictive performance, though Shannon diversity performed better than maximum ASV abundance. Predictive models that combined (1) bacterial diversity or abundance with (2) recent prior VAP diagnosis and (3) concurrent antibiotic exposure best predicted 14-day VAP (type S error < 0.05) and 30-day VAP (type S error < 0.003). In this cohort, VAE risk was paradoxically associated with higher admission Shannon diversity and lower admission maximum ASV abundance. Conclusions: In isolation, respiratory tract

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microbiome disruption indices obtained at LTACH admission showed poor predictive performance for subsequent VAP and VAE. But diversity and abundance models incorporating recent VAP history and admission antibiotic exposure performed well predicting
14-day and 30-day VAP.
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Presentation Type:
Poster Presentation
Comparison of Two Novel Methods for Sink Drain Disinfection
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Background: Sink drainage systems are a potential reservoir for the dissemination of gram-negative bacilli but are not amenable to standard methods of cleaning and disinfection. Pouring liquid disinfectants down drains has only a limited and transient effect on drain colonization, presumably due to inadequate disinfectant contact time and suboptimal penetration into areas harboring biofilm-associated organisms. **Methods:** We compared the antimicrobial efficacy of 2 novel sink disinfection methods intended to enhance disinfectant contact time and penetration. Healthcare facility sinks were randomly assigned to disinfection with 300 mL hydrogen peroxide-based disinfectant applied either as a foam (N = 13 sinks) or instilled for 30 minutes behind a temporary obstruction created by an inflated urinary catheter balloon (N = 12 sinks). Swabs were used to collect quantitative cultures from the proximal sink drain to depth of 2.5 cm (1 inch) below the strainer before treatment and at 15 minutes and 1, 2, 3, 5, and 7 days after treatment. Repeated measures analysis of variance was performed to compare the efficacy of the 2 treatments. **Results:** As shown in Fig. 1, both methods yielded an initial reduction of >3 log10 CFU of gram-negative bacilli. Over the 7-day follow-up period, disinfectant instillation resulted in significantly greater reduction than the foam application ($P < .01$). Recovery of sink colonization to >2 log per swab occurred at day 3 for both treatments, whereas recovery to >3 log per swab occurred on day 3 for the foam treatment versus day 7 for disinfectant instillation. **Conclusions:** Two novel disinfection methods were effective in reducing sink drain colonization for several days. The instillation method was more effective than the foam method in maintaining reductions over 7 days.

Figure. Effect of a single disinfectant treatment on recovery of Gram-negative bacilli from sink drains

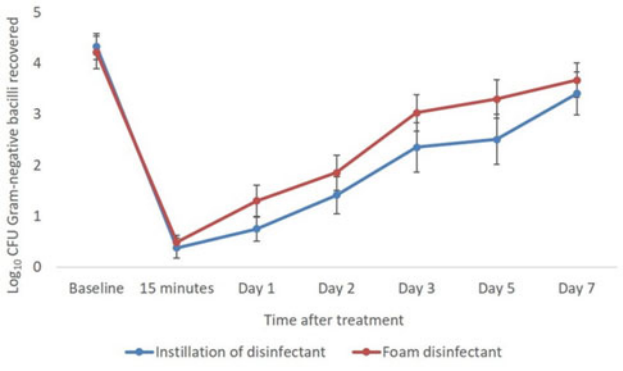

Fig. 1.

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Poster Presentation
Compliance with Standard Precautions Among University Nursing Students From Croatia: A Cross-Sectional Study
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Background: Stringent compliance with standard precautions is of utmost importance for reducing the spread of healthcare-associated infections (HAIs); however, the role of medical and nursing students is often underappreciated. Because undergraduate and graduate nursing programs combine classroom education and clinical training, nursing students are already important stakeholders in HAI risk reduction and patient safety endeavors. **Objectives:** In this study, we appraised self-reported adherence to standard precautions among university nursing students, and we examined factors that may influence their level of compliance. **Methods:** In total, 362 undergraduate and graduate university nursing students form the University North in Croatia (Europe), enrolled in courses or modules with clinical placement, were surveyed in this self-reported cross-sectional study. A 2-part self-administered questionnaire was used, consisting of a demographic survey and a globally applicable 20-item Compliance with Standard Precautions Scale (CSPS). Differences were examined by an independent *t* test and analysis of variance (ANOVA), and factors influencing compliance were further appraised by a standard multiple linear regression analysis. Significance was set at $P < .05$ (2-sided). **Results:** The overall compliance rate in this study was 58.4%. The highest compliance rate was observed for wearing gloves when exposed to body fluids, blood products, and any excretion of patients (82.8%); conversely, the lowest compliance rate was reported for disposing a sharps box before it was full (27.2%). Higher rates of compliance were seen in female nursing students compared with their male counterparts ($P = 0.039$). Even though age was not a significant predictor, there was an increase in compliance rates according to the academic year level ($P < .001$). **Conclusions:** Our results indicate that the overall compliance rate of the Croatian nursing students was moderate, although there was a trend toward more rigorous standard precaution adherence with more education and clinical experience. These findings highlight the need to improve the nursing curriculum to integrate more material on infection control practices early in the program, consequently bridging the gap between theory and practice. Finally, a supportive culture of infection control adherence in quotidian clinical practice must be continuously fostered.
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