

**Presentation Type:**

Poster Presentation

**Subject Category:** Outbreaks**Zero Healthcare-Associated COVID-19**

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**Background:** The ongoing COVID-19 pandemic tests the healthcare system in many ways. The scarcity of resources poses challenges to infection prevention (IP) practices. We describe our experience in managing such scarcity in our care of COVID-19 patients in the hospital as well as community settings. **Methods:** The hospital pandemic plan traditionally included only plans for healthcare delivery management within the hospital. However, on March 25, 2020, a decision was made by the Ministry of Health to set up swab isolation (SIFs) and community care facilities (CCFs) to meet the growing demand for isolation beds for migrant workers infected by COVID-19. The CCFs were located in convention halls and resort centers and the SIFs were located in facilities previously functioning as hotels. Mobile medical teams were activated to run clinics at the dormitories housing 200,000 migrant workers. The IP team of an acute- and tertiary-care hospital in Singapore was activated to oversee IP measures at facilities managed by medical teams from the hospital, with the goal of zero healthcare-associated COVID-19 cases among staff. Two IP leaders were set up to oversee the IP program at 8 dormitories, 4 SIFs, and 2 CCFs. In total, 12 IP staff and 15 infection prevention liaison officers (IPLOs) were deployed from 2 acute-care hospitals and 3 specialty centers to conduct training in hand hygiene and the use of personal protective equipment, and to conduct daily audits of compliance to practice guidelines. Education on personal hygiene was also given to patients in these facilities in at least 7 languages. In the SIFs and dormitories, IPLOs were recruited to perform daily audits and feedback to the IP team on issues related to IP at the sites. **Results:** Since our first COVID-19 patient on January 23, 2020, there has been no report of healthcare-associated COVID-19 within the hospital nor among the medical, administrative, and support service staff working in the external operation facilities. Daily audits showed an average of 99.4% compliance to IP guidelines. **Conclusions:** IPLOs or IP champions play a significant role in ensuring compliance to IP guidelines. This compliance allows the IP professional to focus on the evaluation of the IP program, managing IP consultations, and planning and implementation of the IP program in nontraditional healthcare settings. The key success factors of the program included the ability to contextualize the planning and implementation of IP programs in various settings, strong leadership support, cohesive teamwork, and effective communication at various levels.

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**Subject Category:** Outbreaks***Klebsiella pneumoniae* Carbapenemase (KPC)-Producing *K. pneumoniae* Contamination of an In-Room Sink in a New Bed Tower**

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**Group Name:** Duke Center for Antimicrobial Stewardship and Infection Prevention

**Background:** Wastewater drains in hospital patient rooms have been identified as environmental reservoirs for multidrug-resistant organisms, and they have been linked to outbreaks of carbapenem-resistant Enterobacteriaceae (CRE). We studied the colonization of wastewater drains in a new hospital bed tower. **Methods:** A patient care unit in a new bed tower opened on July 18, 2020. In-room sinks were located in each hospital room opposite the patient head wall. Patients admitted to this unit underwent weekly rectal cultures to survey for carbapenemase-producing CRE. Additionally, infection preventionists performed routine surveillance of all clinical cultures for CRE. Cultures were

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performed from all patient room sinks in this unit monthly beginning September 14, 2020. Samples were obtained from the drain cover, handles, and top of bowl using sponges soaked in neutralizing buffer and processed using the stomacher technique. The tail-pipe was sampled using a flocced mini-tip swab soaked in neutralizing buffer; the P-trap water was sampled with sterile tubing attached to a 50-mL syringe. All samples were plated on HARDYCHROM-ESBL and KPC Colorex media and were incubated at 37°C for 24 hours. **Results:** The first identified CRE-positive patient was admitted to the new unit on December 4, 2020; urine culture obtained at the time of admission grew KPC-producing *Klebsiella pneumoniae* (KPC-KP). The sink in this patient's room had been sampled 3 prior times (most recently on November 9, 2020) and was negative for CRE. On December 7, 2020, KPC-KP was found on the drain cover (6,750 colony-forming units, CFU) and in the sink's P-trap (1,840 CFU) of the index patient's room during routine sink surveillance. Additional samples from other room surfaces were taken on December 9, 2020, and KPC-KP was recovered from the computer keyboard (452 CFU) and patient bedrails (880 CFU). The patient was discharged from this room December 13, 2020, and the room underwent enhanced terminal room cleaning including UV-C light. On the next routine sink sampling on January 4, 2021, KPC-KP was recovered again in the index room sink P-trap (9,800 CFU) but at no additional sites. MLST was performed, and all isolates were ST-258. **Conclusions:** In a new bed tower with no prior evidence of CRE-positive patients, the first identified case of a CRE (KPC-KP) in a patient resulted in widespread environmental contamination of the room after only 3 days of hospitalization and contamination of the in-room sink drain that persisted after 1 month. Given the ease with which CRE colonizes wastewater drains, new strategies are needed to mitigate drain colonization and to prevent CRE transmission to subsequent patients.

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**Subject Category:** Patient Safety**Implementation of a Quality Improvement Role for Unlicensed Assistive Personnel and Effects on Infection Prevention**

Natalie Schnell; Lauren DiBiase; Amy Selimos; Lisa Stancill; Shelley Summerlin-Long and Emily Sickbert-Bennett

**Background:** Care bundles comprise evidence-based practices and interventions that are easily and consistently implemented while improving patient outcomes. As patient acuity and task overload continue to increase, infection prevention bundle and process measure compliance and data collection may become a lower priority for registered nurses (RNs). In early 2019, a certified nursing assistant (CNA) began full-time quality liaison work on a 53-bed inpatient adult oncology unit at UNC Medical Center to provide targeted compliance data collection and to correct deficits in real time when possible and within the appropriate scope of practice. **Methods:** The quality liaison CNA is highly motivated, with a relevant clinical background and effective communication skills. After conducting a gap analysis, the unit developed specific responsibilities for several areas of quality improvement, including infection prevention. In addition to rounding on all patients daily, the quality liaison (1) performs direct patient care tasks like Foley catheter care, (2) conducts patient education on topics such as chlorhexidine gluconate treatments, (3) performs all relevant process measure audits, and (4) easily relays missed or needed care to RNs with a door sign created as part of this initiative. High-risk findings, such as a loose central-line dressing, prompt immediate communication to the RN, with follow-up and escalation when necessary. **Results:** Patients and staff received the quality liaison well, and the increased attention to care bundle components and auditing ensured consistent, evidence-based care along with accurate and reliable data collection. Compared to the previous calendar year, the number of central-line audits on the unit increased by >1,400 by the end of 2019. Patient outcomes improved, and during 1 fiscal year, the unit achieved rate reductions between 40% and 55% for central-line-associated bloodstream infections, catheter-associated urinary tract infections, and

healthcare-associated *C. difficile* infections. Staffing and logistical challenges imposed by the COVID-19 global pandemic have hampered this work because the quality liaison was redeployed to direct patient care intermittently. Correspondingly, from July to October 2020, the same infection rates increased between 30% and 353%. **Conclusions:** Having a designated quality liaison is an effective means to achieving quality improvements while remaining an integral member of the patient care team. As staffing has improved on this unit, the quality liaison has refocused efforts, and infection rates are beginning to improve. Given the success of the quality liaison role in improving quality outcomes on this unit, the hospital is exploring expansion of this model to additional units.

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**Subject Category:** Patient Safety

#### How Do Safety Climate Ratings Relate to Attitudes Towards and Knowledge About Surgical Site Infection Prevention Measures?

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**Group Name:** Watussi Study Group

**Background:** A positive safety climate is an important precursor of safe care outcomes. However, only limited evidence supports the association of low surgical-site infection (SSI) rates and positive safety climate. We investigated the role that perceptions of SSI prevention measures play for both safety climate level and strength as a subjective norm, that is, the social pressure perceived to perform the prevention measures, commitment to observe SSI prevention measures despite other situational pressures, and the level of knowledge about the prevention measures. **Methods:** The safety climate scale of the Safety Attitudes Questionnaire and 3 scales assessing subjective norm, commitment, and knowledge were used. All items were translated and retranslated from German to French and to Italian. All translated scales were pretested for understandability. Operating room (OR) personnel in 54 Swiss acute-care hospitals were surveyed, resulting in 2,769 analyzed responses with data aggregated on the hospital level. Two regression analyses were conducted: one using the percentage of positive responses per hospital as a safety climate level indicator, and another using the standard deviation of the safety climate ratings per hospital as a safety climate strength indicator. As independent variables, the hospital means of subjective norm, commitment, and knowledge were investigated and appropriately adjusted for number of respondents and sample composition. **Results:** The sample consisted of 1,495 nurses (54%) and 1,101 physicians (40%). Commitment and subjective norm were significant predictors ( $p < 0.001$  and  $p < .05$ , respectively) of safety climate level, in the expected positive direction, but KNOW was not ( $R^2$ , adjusted: 0.48); for safety climate strength, only COM was significant  $p < 0.001$  ( $R^2$ , adjusted: 0.27). **Conclusions:** The extent to which OR personnel were committed to perform the measures, such as timely administration of antibiotics, was associated with their safety climate rating level and strength. Thus, the rather general safety climate assessments are related to more specific safety behaviors necessary to achieve good outcomes such as low infection rates. Subjective norm was related to safety climate level only, indicating that in work environments with a good safety climate, the perceived social pressure to adhere to infection prevention measures may be higher. Knowledge about SSI prevention had no significant impact on safety climate, pointing to future research regarding the role of education in implementing prevention measures. Investigating how attitudes and knowledge about measures to prevent specific patient safety outcomes furthers our understanding of the role of safety climate in patient safety improvement.

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**Subject Category:** Patient Safety

#### Risk of Methicillin-Resistant *Staphylococcus aureus* (MRSA) and Vancomycin-Resistant *Enterococcus* (VRE) Acquisition in Ambulances: A Retrospective Propensity Score-Matched Cohort Analysis

Diego Schaps; Deverick Anderson and Andrew Godfrey

**Background:** Infection following ambulance transport, or medical-transport-associated infection (MTAI), is understudied. Although medical-transport vehicles are routinely contaminated with methicillin-resistant *Staphylococcus aureus* (MRSA) and/or vancomycin-resistant *Enterococcus* (VRE), an association between vehicle exposure and disease development has not been identified. We estimated the relative risk (RR) of developing MRSA or VRE colonization or infection within 30 days of ambulance exposure. **Methods:** We performed a retrospective cohort study of patients with a principal diagnosis of chest pain presenting to our emergency department (ED) from January 1, 2016, through December 31, 2019. To control for confounding by healthcare exposure, patients were included if they presented from and were discharged to nonhealthcare locations without being admitted to the hospital. Encounters were stratified by whether the patient arrived at the ED via ambulance or private vehicle. Propensity scores were calculated using multivariable logistic regression with ambulance exposure as the dependent variable. Age, smoking status, history of myocardial infarction, congestive heart failure, peripheral vascular disease, cerebrovascular disease, dementia, diabetes mellitus, and chronic kidney disease were included as covariates because their standard differences were  $>0.10$ . Propensity score matching was performed in a 2:1 ratio, but not all exposed patients received 2 matching unexposed patients due to a low sample size. A multivariable logistic regression was performed on the matched cohort to estimate the RR of newly diagnosed MRSA or VRE infection or colonization within 30 days following ambulance exposure. **Results:** In total, 321,229 patients had ED encounters during the study period. After applying inclusion criteria and propensity score-matching there were 11,324 patients: 3,903 in the ambulance group and 7,421 in the unexposed group. Moreover, 12 patients (0.11%) had the outcome of interest, including 9 (0.08%) with MRSA and 3 (0.03%) with VRE. The 30-day prevalences of MRSA and VRE were larger in the ambulance group than in the unexposed group: 8 (0.20%) and 4 (0.05%), respectively ( $P = .02$ ). Patients who presented to the ED via ambulance were almost 4 times more likely to have MRSA or VRE within 30 days of their encounter (RR, 3.72; 95% CI, 1.09–12.71;  $P = .04$ ). The RRs for MRSA and VRE alone were 3.33 (95% CI, 0.79–13.94;  $P = .10$ ) and 4.14 (95% CI, 0.37–46;  $P = .25$ ), respectively. **Conclusions:** To our knowledge, our cohort study is the first to demonstrate an association between ambulance exposure and the development of disease. These results represent the first step in evaluating MTAI burden to eventually develop targeted interventions with the purpose of reducing it.

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#### Cluster of Invasive *Pseudomonas aeruginosa* Infections in a Neonatal Intensive Care Unit

Hillary Spencer; Ritu Banerjee; Gregory Wilson and Tanya Boswell

**Background:** *Pseudomonas aeruginosa* uncommonly causes illness in neonatal intensive care units (NICU). A cluster of 4 infections was appreciated over 6 weeks in our inborn-delivery NICU, prompting an investigation. **Methods:** Upon recognition of a cluster of infections, we retrospectively audited all cultures positive for *P. aeruginosa* from all sites (sterile and non-sterile) over the prior year in the index NICU (NICU 1, inborn) and for