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

Yvonne Pfeiffer; Andrew Atkinson; Judith Maag; Michael Lane; David Schwappach and Jonas Marschall

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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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 nonsterile) over the prior year in the index NICU (NICU 1, inborn) and for

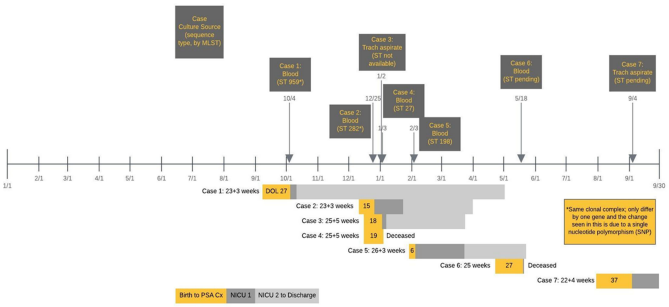

Figure 1.

comparison in the adjacent NICU (NICU 2, larger, outborn–surgical). We performed multilocus sequence testing (MLST) of available clinical isolates to identify clonality. We initiated quarterly prospective surveillance of *P. aeruginosa* colonization of infants through nares, perirectal swabs, and tracheal aspirates of intubated infants or oropharyngeal swabs of nonintubated infants. We also swabbed incubators, ventilatory equipment, and sinks for selective *P. aeruginosa* culturing. **Results:** We identified 7 invasive *P. aeruginosa* infections in the inborn NICU (5 bloodstream and 2 pneumonia) over an 11-month period (Figure 1). Over the same period, there were no *P. aeruginosa* bloodstream infections in the adjacent NICU. Affected neonates were high risk: gestational age ranged from 22 weeks and 4 days to 26 weeks and 3 days; day of life at infection ranged from 6 to 37; 6 infants were on a jet ventilator; and all infants were receiving enteral nutrition (6 of 7 with donor human milk and 7 of 7 with expressed mother's milk). Two infants died from their infection, and 5 infants survived to hospital discharge. All 7 isolates were pansusceptible to routine antimicrobials. MLST of the first 4 available isolates demonstrated 4 different sequence types; however, the first 2 were from the same clonal complex, indicating relatedness (Figure 1). For environmental samples, 8 obtained 8 cultures (swabs) of incubators and ventilatory equipment, and 24 cultures of faucets and drains of all sinks. Only sink cultures were positive, yielding 3 isolates identified as *P. aeruginosa* and 4 isolates identified as *P. aeruginosa*–like. Whole-genome sequencing (WGS) is underway to identify relatedness to the clinical isolates. We initiated quarterly infant surveillance by swab culture for *P. aeruginosa* nasal colonization then escalated to perirectal and oropharyngeal swab or tracheal aspirate cultures (intubated infants) in subsequent quarters. We did not detect any infants colonized with *P. aeruginosa*. **Conclusions:** We identified a cluster of *P. aeruginosa* in high-risk neonates with no point source. Molecular typing indicated a multiclonal cluster. This finding poses a management dilemma. A colonized water system is suspected and WGS of environmental samples is underway.

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Healthcare-Associated Viral Respiratory Infections in a Pediatric Intensive Care Unit and Cardiovascular Intensive Care Unit

Kelly Feldman; Jasjit Singh and Wendi Gornick

Background: Healthcare-associated infections (HAIs) affect patient health and are tracked closely by infection prevention. Patients in a pediatric intensive care unit (PICU) acquired viral respiratory infections had longer use of respiratory support. We sought to determine the types of viral respiratory HAIs (VR-HAIs) acquired in the PICU and the characteristics of those affected. **Methods:** CHOC Children's Hospital is a 334-bed tertiary-care center. Charts were reviewed on patients with VR-HAIs from fiscal years (FY) 2005–2020. High-risk VR-HAI (HR-VR-HAI) were influenza A and B, respiratory syncytial virus (RSV), adenovirus, parainfluenza, and human metapneumovirus (hMPV, added in FY 2014). Patients in the PICU, cardiovascular ICU (CVICU), and oncology ICU (OICU) with HR-VR-HAIs were reviewed. Patients were categorized according to underlying pathology, immunosuppression, and isolation prior to HR-VR-HAI. Increased respiratory support was defined as any increase from a patient's baseline support ±24 hours of viral diagnosis: increase in oxygen flow or transition from nasal cannula to high-flow nasal cannula or ventilator support. Antibiotic escalation, defined as initiation of antibiotic therapy for ≥2 days ±24 hours of viral diagnosis or broadening the spectrum of antimicrobials for ≥2 days ±24 hours of viral diagnosis. **Results:** During FY 2005–2020, there were 204 VR-HAIs: 143 HR-VR-HAIs (70%), of which 39 (27.2%) occurred in ICUs (Figure 1). Most of the HR-VR-HAIs were RSV, parainfluenza, and hMPV (Figure 2). Of 39 patients, 10 (25.6%) had underlying oncologic conditions, 9 of whom were immunosuppressed. Of 39 patients, 16 (41%) had structural cardiac disease, 4 (10.3%) had pulmonary disease, 5 (12.8%) had neurologic disease, and the remaining 4 (10.3%) had other comorbidities. Of 39 patients, 12 (31%) required an increase in respiratory support and 13 (33%) had escalation of antibiotics. Of 39 HR-VR-HAI patients, 2 died within 2 weeks of acquisition. **Conclusions:** HR-VR-HAIs are uncommon in ICUs. RSV, parainfluenza, and hMPV are the most common, and 1 of 3 patients required escalation in respiratory support and/or escalation in antibiotics. All patients had

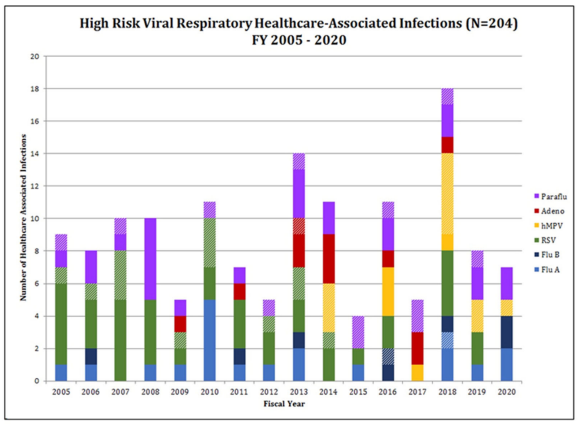

Figure 1. High Risk Viral Respiratory Healthcare-Associated Infections in a children's hospital between fiscal years 2005 to 2020. Total viruses are indicated by the bar for the year. The subset of viruses that were acquired in an ICU are indicated with cross hatching.

Figure 1.

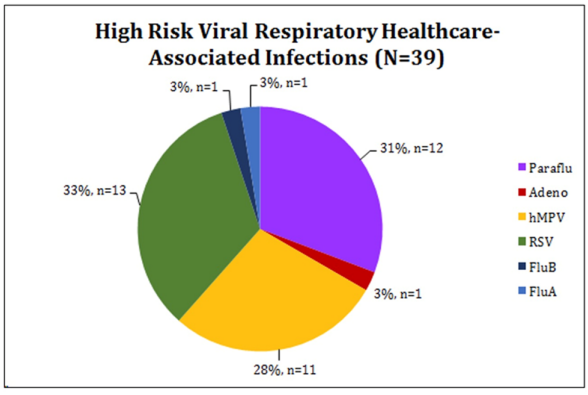

Figure 2. High Risk Viral Respiratory Healthcare-Associated Infections (parainfluenza, adenovirus, human metapneumovirus, respiratory syncytial virus, and influenza A/B) in an ICU between fiscal years 2005 to 2020.

Figure 2.