facility were interviewed during the dayshift. HCP on 38 units were interviewed to identify healthcare personnel (HCP)–resident care patterns. All unit staff were eligible for interviews, including certified nursing assistants (CNAs), nurses, physical or occupational therapists, physicians, midlevel practitioners, and respiratory therapists. HCP were asked to list which residents they had cared for (within resident rooms or common areas) since the prior interview. Respondents selected from 14 care tasks. We classified units into 1 of 4 types: long-term, mixed, short stay or rehabilitation, or ventilator or skilled nursing. Interactions were classified based on the risk of HCP contamination after task performance. We compared proportions of interactions associated with each HCP role and performed clustered linear regression to determine the effect of unit type and HCP role on the number of unique task types performed per interaction. **Results:** Intercept-interviews described 7,050 interactions and 13,843 care tasks. Except in ventilator or skilled nursing units, CNAs have the greatest proportion of care interactions (interfacility range, 50%–60%) (Fig. 1). In ventilator and skilled nursing units, interactions are evenly shared between CNAs and nurses (43% and 47%, respectively). On average, CNAs in ventilator and skilled nursing units perform the most unique task types (2.5 task types per interaction, Fig. 2) compared to other unit types ($P < .05$). Compared to CNAs, most other HCP types had significantly fewer task types (0.6–1.4 task types per interaction, $P < .001$). Across all facilities, 45.6% of interactions included tasks that were higher-risk for HCP contamination (eg, transferring, wound and device care, Fig. 3). **Conclusions:** Focusing infection prevention education efforts on CNAs may be most efficient for preventing MDRO transmission within NH because CNAs have the most HCP–resident interactions and complete more tasks per visit. Studies of HCP-resident interactions are critical to improving understanding of transmission mechanisms as well as target MDRO prevention interventions.

Presentation Type:
Oral Presentation
Feasible Surgical Site Infection Surveillance in Resource-Limited Settings: A Pilot in Sierra Leone

Matthew Westercamp, Centers for Disease Control and Prevention; Aqueelah Barrie, World Health Organization, Freetown, Sierra Leone; Christiana Conteh, Sierra Leone Ministry of Health and Sanitation; Danica Gomes, Centers for Disease Control and Prevention; Hassan Benya, US Centers for Disease Control and Prevention; Jamine Weiss, US Centers for Diseases Control and Prevention; Anna Maruta, World Health Organization—Sierra Leone; Rachel Smith, Centers for Disease Control and Prevention

Background: Surgical site infections (SSIs) are among the most common healthcare-associated infections (HAIs) in low- and middle-income countries (LMICs). SSI surveillance can be challenging and resource-intensive to implement in LMICs. To support feasible LMIC SSI surveillance, we piloted a multisite SSI surveillance protocol using simplified case definitions and methodology in Sierra Leone. **Methods:** A standardized evaluation tool was used to assess SSI surveillance knowledge, capacity, and attitudes at 5 proposed facilities. We used simplified case definitions restricted to objective, observable criteria (eg, wound purulence or intentional reopening) without considering the depth of infection. Surveillance was limited to post-cesarean delivery patients to control variability of patient-level infection risk and to decrease data collection requirements. Phone-based patient interviews at 30-days facilitated postdischarge case finding. Surveillance activities utilized existing clinical staff without monetary incentives. The Ministry of Health provided training and support for data management and analysis. **Results:** Three facilities were selected for initial implementation. At all facilities, administration and surgical staff described most, or all, infections as "preventable" and all considered SSIs an "important problem" at their facility. However, capacity assessments revealed limited staff availability to support surveillance activities, limited experience in systematic data collection, nonstandardized patient records as the basis for data collection, lack of unique and consistent patient identifiers to link patient encounters, and no quality-assured microbiology services. To limit system demands and to maximize usefulness, our surveillance data collection elements were built into a newly developed clinical surgical safety checklist that was designed to support surgeons' clinical decision making. Following implementation and 2 months of SSI surveillance activities, 77% (392 of 509) of post-cesarean delivery patients had a checklist completed within the surveillance system. Only 145 of 392 patients (37%) under surveillance were contacted for final 30-day phone interview. Combined SSI rate for the initial 2-months of data collection in Sierra Leone was 8% (32 of 392) with 31% (10 of 32) identified through postdischarge case finding. **Discussion:** The surveillance strategy piloted in Sierra Leone represents a departure from established HAI strategies in the use of simplified case definitions and implementation methods that prioritize current feasibility in a resource-limited setting. However, our pilot implementation results suggest that even these simplified SSI surveillance methods may lack sustainability without additional resources, especially in postdischarge case finding. However, even limited phone-based patient interviews identified a substantial number of infections in this population. Although it was not addressed in this pilot study, feasible laboratory capacity building to support HAI surveillance efforts and promote appropriate treatment should be explored.

Presentation Type:
Oral Presentation
Group Electronic Monitoring of Hand Hygiene on Inpatient Units: A Multicenter Cluster Randomized Quality Improvement Study

Jerome Leis, University of Toronto; Jeff Powis, Michael Garron Hospital, Toronto, Ontario, Canada; Allison McGeer, Mount Sinai Hospital; Daniel Ricciuto, Lakeridge Health, Oshawa, Ontario, Toronto; Tanya Agnihotri, Sunnybrook Health Sciences Centre, Toronto, Ontario, Canada; Natalie Coyle, Sunnybrook Health Sciences Centre, Toronto, Ontario, Canada; Victoria Williams, Sunnybrook Health Sciences Centre; Christine Moore, Sinai Health System, Toronto, Ontario, Canada; Natasha Salt, Sunnybrook Health Sciences Center; Louis Wong, Sinai Health System; Liz McCreight, Sinai Health System, Toronto, Ontario, Canada; Sajeetha Sivaramakrishna, Michael Garron Hospital, Toronto, Ontario, Canada; Shara Junaid, St Michael's Hospital; Xingshan Cao, Sunnybrook Health Sciences Centre, Toronto, Ontario, Canada; Matthew Muller, Unity Health, Toronto, Ontario, Canada

CrossMark

Background: The current approach to measuring hand hygiene (HH) relies on human auditors who capture <1% of HH opportunities and rapidly become recognized by staff, resulting in inflation in performance. Our goal was to assess the impact of group electronic monitoring coupled with unit-led quality improvement on HH performance and prevention of healthcare-associated transmission and infection. **Methods:** A stepped-wedge cluster randomized quality improvement study was undertaken across 5 acute-care hospitals in Ontario, Canada. Overall, 746 inpatient beds were electronically monitored across 26 inpatient medical and surgical units. Daily HH performance as measured by group electronic monitoring was reported to inpatient units who discussed results to guide unit-led improvement strategies. The primary outcome was monthly HH adherence (%) between baseline and intervention. Secondary outcomes included transmission of antibiotic resistant organisms such as methicillin resistant *Staphylococcus aureus* (MRSA) and other healthcare-associated infections. **Results:** After adjusting for the correlation within inpatient units, there was a significant overall improvement in HH adherence associated with the intervention (IRR, 1.73; 95% CI, 1.47–1.99; $P < .0001$). Monthly HH adherence relative to the intervention increased from 29% (1,395,450 of 4,544,144) to 37% (598,035 of 1,536,643) within 1 month, followed by consecutive incremental increases up to 53% (804,108 of 1,515,537) by 10 months ($P < .0001$). We identified a trend toward reduced healthcare-associated transmission of MRSA (0.74; 95% CI, 0.53–1.04; $P = .08$). **Conclusions:** The introduction of a system for group electronic monitoring led to rapid, significant, and sustained improvements in HH performance within a 2-year period.

Presentation Type:
Oral Presentation
HAI-Proactive: Development of an Automated Surveillance System for Healthcare-Associated Infections in Sweden

Pontus Naucler, PO Infektion, Karolinska University Hospital; Suzanne D. van der Werff, Department of Medicine Solna, Karolinska Institutet; John Valik, Dept of Medicine, Solna, Karolinska Institutet; Logan Ward, Treat Systems ApS, Aalborg, Denmark; Anders Ternhag, Dept of Medicine, Solna, Karolinska Institutet; Hideyuki Tanushi, Karolinska University Hospital; Aikaterini Mougkou, Karolinska University Hospital Per Englund, Karolinska University Hospital; Elda Sparrelid, Region Stockholm; Anna Färnert, Dept of Medicine, Solna, Karolinska Institutet; Mads Mogensen, Treat Systems ApS, Aalborg, Denmark; Aron Henriksson, DSV, Stockholm University; Hercules Dalianis, DSV, Stockholm University; Brian Pickering, Mayo Clinic; Vitaly Herasevich, Mayo Clinic; Anders Johansson, MIMS, Clinical Microbiology, Umea University, Sweden; Emil Thiman, Karolinska University Hospital

Background: Healthcare-associated infection (HAI) surveillance is essential for most infection prevention programs and continuous epidemiological data can be used to inform healthcare personal, allocate resources, and evaluate interventions to prevent HAIs. Many HAI surveillance systems today are based on time-consuming and resource-intensive manual reviews of patient records. The objective of HAI-proactive, a Swedish triple-helix innovation project, is to develop and implement a fully automated HAI surveillance system based on electronic health record data. Furthermore, the project aims to develop machine-learning–based screening algorithms for early prediction of HAI at the individual patient level. **Methods:** The project is performed with support from Sweden's Innovation Agency in collaboration among academic, health, and industry partners. Development of rule-based and machine-learning algorithms is performed within a research database, which consists of all electronic health record data from patients admitted to the Karolinska University Hospital. Natural language processing is used for processing free-text medical notes. To validate algorithm performance, manual annotation was performed based on international HAI definitions from the European Center for Disease Prevention and Control, Centers for Disease Control and Prevention, and Sepsis-3 criteria. Currently, the project is building a platform for real-time data access to implement the algorithms within Region Stockholm. **Results:** The project has developed a rule-based surveillance algorithm for sepsis that continuously monitors patients admitted to the hospital, with a sensitivity of 0.89 (95% CI, 0.85–0.93), a specificity of 0.99 (0.98–0.99), a positive predictive value of 0.88 (0.83–0.93), and a negative predictive value of 0.99 (0.98–0.99). The healthcare-associated urinary tract infection surveillance algorithm, which is based on free-text analysis and negations to define symptoms, had a sensitivity of 0.73 (0.66–0.80) and a positive predictive value of 0.68 (0.61–0.75). The sensitivity and positive predictive value of an algorithm based on significant bacterial growth in urine culture only was 0.99 (0.97–1.00) and 0.39 (0.34–0.44), respectively. The surveillance system detected differences in incidences between hospital wards and over time. Development of surveillance algorithms for pneumonia, catheter-related infections and *Clostridioides difficile* infections, as well as machine-learning–based models for early prediction, is ongoing. We intend to present results from all algorithms. **Conclusions:** With access to electronic health record data, we have shown that it is feasible to develop a fully automated HAI surveillance system based on algorithms using both structured data and free text for the main healthcare-associated infections.

Presentation Type:
Oral Presentation
High-Risk Interactions for Transmission of CRE to Health Worker Gloves or Gown: A Multicenter Cohort Study

Lyndsay O'Hara, University of Maryland School of Medicine; David Calfee, NY-Presbyterian/Weill Cornell; Loren Miller, Harbor-UCLA Medical Center; Minh-Hong Nguyen, University of Pittsburgh, Department of Medicine; Lisa Pineles, University of Maryland School of Medicine; Laurence Magder, University of Maryland School of Medicine; J. Kristie Johnson, University of Maryland School of Medicine; Daniel Morgan, University of Maryland School of Medicine; Anthony Harris, University of Maryland School of Medicine

Background: Carbapenem-resistant *Enterobacteriaceae* (CRE) are a serious threat to public health due to high associated morbidity and mortality. Healthcare personnel (HCP) gloves and gowns are frequently contaminated with antibiotic-resistant bacteria, including CRE. We aimed to identify patients more likely to transmit CRE to HCP gloves or gowns and HCP types and interactions more likely