2016. A diagnosis of UTI was categorized as cystitis, urethritis or pyelonephritis and was defined using the following ICD-10 codes: N30.0, N30.00, N30.01, N30.9, N30.90, N30.91, N39.0, N34.1, N34.2, and N10. The following antibiotics were prescribed: aminoglycosides, sulfamethoxazole/trimethoprim (TMP-SMX), cephalosporins, fluoroquinolones, macrolides, penicillins, tetracyclines, or nitrofurantoin. Patients were categorized based on gender, age, location, insurance payer and UTI type. We used χ^2 and Cochran-Mantel-Haenszel testing. Analyses were performed in SAS version 9.4 software (SAS Institute, Cary, NC). **Results:** In total, 15,580 patients were included in this study. Prescriptions for antibiotics by drug class differed significantly by gender ($P < .0001$), age ($P < .0001$), geographic region ($P < .0001$), insurance payer ($P < .0001$), and UTI type ($P < .0001$). Cephalosporins were prescribed more often to women (32.48%, 4,173 of 12,846) than to men (26.26%, 718 of 2,734), and fluoroquinolones were prescribed more often to men (53.88%, 1,473 of 2,734) than to women (47.91%, 6,155 of 12,846). Although cephalosporins were prescribed most frequently (42.58%, 557 of 1,308) in northern Virginia, fluoroquinolones were prescribed the most in eastern Virginia (50.76%, 1677 of 3,304). Patients with commercial health insurance, Medicaid, and Medicare were prescribed fluoroquinolones (39.31%, 1,149 of 2,923), cephalosporins (56.33%, 1,326 of 2,354), and fluoroquinolones (57.36%, 5,910 of 10,303) most frequently, respectively. **Conclusions:** Antibiotic prescribing trends for UTIs varied by gender, age, geographic region, payer status and UTI type in the state of Virginia. These data will inform future statewide antimicrobial stewardship efforts.

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Poster Presentation

A Growing Concern: The Emergence and Dissemination of Carbapenemase-producing Enterobacterales (CPE) in Canada

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Background: Carbapenemase-producing Enterobacterales (CPE) have rapidly become a global health concern and are associated with substantial morbidity and mortality due to limited treatment options. Travel to endemic areas, especially healthcare exposure in these areas, is an important risk factor for acquisition. We describe the evolving epidemiology, molecular features, and outcomes of CPE in Canada through surveillance by the Canadian Nosocomial Infection Surveillance Program (CNISP). **Methods:** CNISP has conducted surveillance for CPE among inpatients and outpatients of all ages since 2010. Participating acute-care facilities submit eligible specimens to the National Microbiology Laboratory for detection of carbapenemase production, and epidemiological data are collected. Incidence rates per 10,000 patient days are calculated based on inpatient data. **Results:** In total, 59 CNISP hospitals in 10 Canadian provinces representing 21,789 beds and 6,785,013 patient days participated in this surveillance. From 2010 to 2018, 118 (26%) CPE-infected and 547 (74%) CPE-colonized patients were identified. Few pediatric cases were identified (n = 18). Infection incidence rates remain low and stable (0.02 per 10,000 patient days in 2010 to 0.03 per 10,000 patient days in 2018), and colonization incidence rates have increased by 89% over the surveillance period. Overall, 92% of cases were acquired in a healthcare facility: 61% (n = 278) in a Canadian healthcare facility and 31% (n = 142) in a healthcare facility outside Canada. Of the 8% of cases not acquired in a healthcare facility, 50% (16 of 32) reported travel outside of Canada in the 12 months prior to positive culture. The distribution of carbapenemases varied by region; New Delhi metallo-*B*-lactamase (NDM) was dominant (59%) in western Canada and *Klebsiella pneumoniae* carbapenemase (KPC) (66%) in central Canada. NDM and class D carbapenemase OXA-48 were more commonly identified among those who traveled outside of Canada, whereas KPC was more commonly identified among patients without travel. In addition, 30-day all-cause mortality was 14% (25 of 181) among CPE infected patients and 32% (14 of 44) among those with bacteremia. **Conclusions:** CPE rates remain low in Canada; however, national surveillance data suggest that the increase in CPE in Canada is now being driven by local nosocomial transmission as well as travel and healthcare within endemic areas. Changes in screening practices may have contributed to the increase in colonizations; however, these data are currently lacking and will be collected moving forward. These data highlight the need to intensify surveillance and coordinate infection control measures to prevent further spread of CPE in Canadian acute-care hospitals.

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Poster Presentation

A Large-Scale Snapshot of Standard Precaution Adherence: "Do as I Say Not as I Do"

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Background: Nearly 1 in 25 patients has a hospital infection at any given time, and 1 in 25 nurses suffers and bloodborne exposure every year. Basic procedures, termed standard

precautions (SP) may prevent these outcomes, but they are not often used by healthcare workers. Unfortunately, data are largely limited by self-reporting because no standardized tools exist to capture observational data. **Objective:** The specific aim of this study was to describe the relationship between self-reported and observed SP adherence. **Methods:** This multisite, cross-sectional study included 2 elements: (1) surveys of nurses in US hospital units on perceptions of patient safety climate and reported SP adherence and (2) observational SP data. Survey data included 12 items on SP practices (eg, "how often you perform hand hygiene before touching a patient") and 10 items on SP environment (eg, "my work area is not cluttered"), rated on a 5-point scale from "never" to "always" or from "strongly disagree" to "strongly agree," respectively. Using novel tools developed and previously pilot tested, we recruited and trained hospital-based staff on observational surveillance methodology to foster the *National Occupational Research Agenda* goals. The 10 observational SP items represented the following 4 categories: (1) hand hygiene, (2) personal protective equipment (PPE), (3) sharps, and (4) soiled linen handling. Observations of healthcare worker–patient interactions followed training and interrater reliability testing. All data were aggregated, and analyses were conducted at the unit level. Pearson correlation coefficients were calculated to determine the relationship between reported and observed SP practices (level of significance, $P < .05$). **Results:** In total, 6,518 SP indications were observed and 500 surveys were collected from nurses on 54 units in 15 hospitals from 6 states. The final analytic sample included 5,285 SP indications and 452 surveys from 43 units in 13 hospitals that provided both types of data. Most indications observed were of HH (72.6%). Overall SP adherence was 64.4%. In descending order, adherence rates were PPE (81.8%), sharps handling (80.9%), linen handing (68.3%), and hand hygiene (58.3%). The aggregate of positive self-reported SP practices was 95.8%, and 77.3% rated unit environment for SP adherence positively. There was no correlation between observed adherence and reported adherence (r (41) = (−).024, P = .879). **Conclusions:** In this study, the largest study of SP adherence, observed practice was grossly suboptimal, particularly hand hygiene. Conversely, nurses on the same units rated adherence as high, despite the environment. In combination, both sources of surveillance data provide valuable and actionable insight to target interventions.

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A Portable, Easily Deployed Approach to Measure Healthcare Professional Contact Networks in Long-Term Care Settings

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Background: The movement of healthcare professionals (HCPs) induces an indirect contact network: touching a patient or the environment in one area, then again elsewhere, can spread healthcare-associated pathogens from 1 patient to another. Thus, understanding HCP movement is vital to calibrating mathematical models of healthcare-associated infections. Because long-term care facilities (LTCFs) are an important locus of transmission and have been understudied relative to hospitals, we developed a system for measuring contact patterns specifically within an LTCF. **Methods:** To measure HCP movement patterns, we used badges (credit-card–sized, programmable, battery-powered devices with wireless proximity sensors) worn by HCPs and placed in 30 locations for 3 days. Each badge broadcasts a brief message every 8 seconds. When received by other badges within range, the recipients recorded the time, source badge identifier, and signal strength. By fusing the data collected by all badges with a facility map, we estimated when and for how long each HCP was in any of the locations where instruments had been installed. **Results:** Combining the messages captured by all of our devices, we calculated the dwell time for each job type (eg, nurses, nursing assistants, physical therapists) in different locations (eg, resident rooms, dining areas, nurses stations, hallways, etc). Although dwell times over all job and area types averaged ~100 seconds, the standard deviation was large (115 seconds), with a mean of maximums by job type of ~450 seconds. For example, nursing assistants spent substantially more time in resident rooms and transitioned across rooms at a much higher rate. Overall, each distribution exhibits a power-law–like characteristic. By aggregating the data from devices with location data extracted from the floor plan, we were able to produce an explicit trace for each individual (identified only by job type) for each day and to compute cross-table transition probabilities by area for each job type. **Conclusions:** We developed a portable system for measuring contact patterns in long-term care settings. Our results confirm that frequent interactions between HCPs and LTC residents occur, but they are not uniform across job types or resident locations. The data produced by our system can be used to better calibrate mathematical models of pathogen spread in LTCs. Moreover, our system can be easily and quickly deployed to any healthcare settings to similarly inform outbreak investigations.

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A Prevention Initiative to Reduce Healthcare-Associated Bloodstream Infections in a Spanish University Hospital

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