

Background: Carbapenem-resistant *Enterobacteriaceae* (CRE) are an important cause of healthcare-associated infections (HAIs) in human hospitals. The Philadelphia Department of Public Health (PDPH) made CRE reportable in April 2018. In May 2019, the Matthew J. Ryan Veterinary Hospital (MJRVH) reported an NDM-5 *Escherichia coli* cluster in companion animals to the PDPH. In total, 15 infected animals (14 dogs and 1 cat) were reported between July 2018 and June 2019, with no new infections after June 2019. Limited literature is available on the prevalence of CRE in companion animals, and recommendations for dealing with CRE infections currently target human healthcare settings. **Methods:** A collaborative containment response included assessing interspecies transmission to veterinary staff and a comprehensive evaluation of the infection control program at MJRVH. MJRVH notified all owners of affected animals verbally and via notification letters with PDPH recommendations for CRE colonization screening of high-risk individuals. CRE screening of exposed high-risk employees was conducted by the University of Pennsylvania Occupational Health service and PDPH. Human rectal swabs were analyzed at the Antibiotic Resistance Laboratory Network (ARLN) Maryland Laboratory. PDPH were invited to conduct an onsite infection control assessment and to suggest improvements. **Results:** No pet owners self-identified in high-risk groups to be screened. In total, 10 high-risk staff were screened, and no colonized individuals were detected. Recommendations made by the PDPH to MJRVH included improvement of infection prevention and control policies (eg, consolidation of the infection control manual and identification of lead staff member), improvement in hand hygiene (HH) compliance (eg, increasing amount of HH supplies), improvement of environment of care (eg, decluttering and evaluation of mulched animal relief area), and improvement of respiratory care processes (eg, standardization of care policies). MJRVH made substantial improvements across recommendation areas including revision of infection control manual, creation of a full-time infection preventionist position, individual alcohol hand sanitizers for patient cages, and environmental decluttering and decontamination. PDPH and MJRVH maintained frequent communication about infection control improvements. **Conclusions:** No positive transmission to high-risk staff members suggest that, like in human healthcare facilities, transmission of CRE to

caretakers may not be a common event. Stronger communication and collaboration is required from Departments of Public Health (DPH) to the veterinary profession regarding the reporting requirements of emerging pathogens such as CRE. Veterinary facilities should view DPH as a valuable resource for recommendations to fill in gaps that exist in infection control “best practices,” particularly for novel pathogens in veterinary settings.

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Poster Presentation

A Descriptive Analysis of Outpatient Antimicrobial Use for Urinary Tract Infections in Virginia

Hasti Mazdeyasn, Virginia Commonwealth University School of Medicine; Shaina Bernard, Virginia Department of Health; Le Kang, VCU Health; Emily Godbout, Children's Hospital of Richmond at VCUHS; Kimberly Lee, VCU Medical Center; Amy Pakyz, Virginia Commonwealth University; Andrew Noda, Virginia Commonwealth University Health System; Jihye Kim, VCU Health; John Daniel Markley, Virginia Commonwealth University Medical Center/Hunter Holmes McGuire VA Medical Center; Michelle Elizabeth Doll, Virginia Commonwealth University; Gonzalo Bearman, Virginia Commonwealth University VCUHS Epidemiology and Infection Control Michael Stevens, Virginia Commonwealth University School of Medicine

Background: Data regarding outpatient antibiotic prescribing for urinary tract infections (UTIs) are limited, and they have never been formally summarized in Virginia. **Objective:** We describe outpatient antibiotic prescribing trends for UTIs based on gender, age, geographic region, insurance payer and *International Classification of Disease, Tenth Revision* (ICD-10) codes in Virginia. **Methods:** We used the Virginia All-Payer Claims Database (APCD), administered by Virginia Health Information (VHI), which holds data for Medicare, Medicaid, and private insurance. The study cohort included Virginia residents who had a primary diagnosis of UTI, had an antibiotic claim 0–3 days after the date of the diagnosis and who were seen in an outpatient facility in Virginia between January 1, 2016, and December 31,

Table 1. Select Antimicrobials Prescribed by Gender and Diagnosis Type

Characteristic	TMP-SMX	Cephalosporins	Fluoroquinolones	Tetracyclines	Nitrofurantoin
Gender					
Female	529	4,173	6,155	224	681
Male	108	718	1,473	94	74
Diagnosis					
Cystitis	619	4,844	7,533	290	742
Urethritis	2	15	36	28	2
Acute pyelonephritis	16	32	59	0	11

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%, 1,677 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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A Growing Concern: The Emergence and Dissemination of Carbapenemase-producing Enterobacteriales (CPE) in Canada
 Robyn Mitchell, Public Health Agency of Canada; Laura Mataseje, National Microbiology Laboratory; David Boyd, National Microbiology Laboratory, Public Health Agency of Canada; Ghada Al-Rawahi, BC Childrens Hospital; Ian Davis, Queen Elizabeth II Health Sciences Centre; Chelsey Ellis, Horizon Health Network, Moncton, The Moncton Hospital, Moncton; Joanne Embree, Health Sciences Centre, Winnipeg, MB; Susy Hota, University Health Network; Pamela Kibsey, Royal Jubilee Hospital; Christian Lavallée, Hôpital Maisonneuve-Rosemont, Montreal, QC; Jerome Leis, University of Toronto; Allison McGeer, Mount Sinai Hospital; Jessica Minion, Regina Qu'Appelle Health Region, Regina, SK; Michael Mulvey, National Microbiology Laboratory; Sonja Musto, Health Sciences Centre, Winnipeg, MB; Linda Pelude, Public Health Agency of Canada; Jocelyn Srigley, BC Children's & Women's Hospitals; Stephanie Smith, University of Alberta; Kathryn N. Suh, The Ottawa Hospital, Ottawa, ON; Geoffrey Taylor, University of Alberta Hospital, Edmonton, AB; Nisha Thampi, Children's Hospital of Eastern Ontario; Titus Wong, Vancouver General Hospital, Vancouver, BC; Kevin Katz, North York General Hospital; CNISP PHAC, Public Health Agency of Canada

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

Amanda Hessel, Columbia University, School of Nursing; Jingwen Guo, Columbia University

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