was tested by reference BMD at the CDC according to CLSI guidelines. **Results:** Overall, 1,787 isolates from 112 clinical laboratories were tested by BMD at the CDC. Of these, clinical laboratory ATI MIC results were available for 1,638 (91.7%); 855 (52.2%) from 71 clinical laboratories did not confirm as CRE at the CDC. Nonconfirming isolates were tested on either a MicroScan (235 of 462; 50.9%), BD Phoenix (249 of 411; 60.6%), or VITEK 2 (371 of 765; 48.5%). Lack of confirmation was most common among *E. coli* (62.2% of *E. coli* isolates tested) and *Enterobacter* spp (61.4% of *Enterobacter* isolates tested) (Fig. 1A), and among isolates testing resistant to ertapenem by the clinical laboratory ATI (52.1%, Fig. 1B). Of the 1,388 isolates resistant to ertapenem in the clinical laboratory, 1,006 (72.5%) were resistant only to ertapenem. Of the 855 nonconfirming isolates, 638 (74.6%) were resistant only to ertapenem based on clinical laboratory ATI MICs. **Conclusions:** Nonconfirming isolates were widespread across laboratories and ATIs. Lack of confirmation was most common among *E. coli* and *Enterobacter* spp. Among nonconfirming isolates, most were resistant only to ertapenem. These findings may suggest that ATIs overcall resistance to ertapenem or that isolate transport and storage conditions affect ertapenem resistance. Further investigation into this lack of confirmation is needed, and CRE case identification in public health surveillance may need to account for this phenomenon.

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Poster Presentation

Evaluation of a Large Urban–Rural Outpatient Antibiotic Stewardship Program

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Background: Judicious prescribing of antibiotics is necessary in addressing the crisis of emerging antibiotic resistance and reducing adverse events. Nearly half of antibiotic prescriptions in the outpatient setting are inappropriate, most for viral upper respiratory infections (URIs). Data outlining the misuse of antibiotics in the outpatient setting provide compelling evidence of the need for more rational use of antimicrobial agents beyond hospital settings. **Objectives:** We evaluated the effect of a behaviorally enhanced quality improvement (QI) intervention to reduce inappropriate antibiotic prescribing for viral URI in the ambulatory care clinics of a large quaternary care healthcare system serving an urban-rural population. **Methods:** The outpatient antibiotic stewardship program was implemented in January 2018 at 5 pilot sites. Interventions included identification of a site champion, educational sessions, sharing of clinic and individual provider data, and patient and provider educational materials. In addition, preclinic huddles and resident education sessions for internal medicine resident physicians were conducted with a display of public commitment to prescribe antibiotics appropriately. Site champions collaborated with onsite staff to ensure interventions were consistent with local workflows, policies, and standards. The primary outcome was defined as the provider-level antibiotic prescribing rate for acute URI, defined as patient visits with antibiotic-nonresponsive diagnoses without concomitant diagnostic codes to support antibiotic prescribing (see the public MITIGATE tool kit for a complete list). **Results:** In total, 116,122 antibiotic prescriptions were dispensed from April 2017 through December 2018 compared to the period from April 2017 to December 2017 during which 9,129 fewer prescriptions were ordered. Inappropriate antibiotic prescribing for viral URI for ambulatory clinic encounters ($n \geq 45{,}000$ visits per month) declined from 14.3% to 7.6%. Academic hospital-based sites showed little seasonality trends and no statistically significant decrease in prescription rates ($P = .5176$). On the other hand, community-based sites showed strong seasonal fluctuations and a statistically significant decrease in prescription rates after intervention ($P = .000189$). **Conclusions:** A multifaceted behaviorally enhanced QI intervention to reduce inappropriate prescribing for URI in ambulatory care encounters at a large integrated health system was successful in reducing both inappropriate prescriptions for presumed viral URI as well as total antibiotic use. Findings suggest that implementing leadership roles, education sessions, and low resource behavioral nudging (peer comparison and public commitment) together can decrease excessive use of antibiotics by physicians. A Hawthorne effect may be an important component of these interventions. Future studies are needed in order to determine the optimal combination of behavioral interventions that are cost-effective in outpatient settings.

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Poster Presentation

Evaluation of Patients' Adverse Events Associated With Contact Isolation: Matched Cohort Study With Propensity Score

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Background: Contact isolation (ie, patient isolation with contact precautions) has been frequently used for preventing healthcare-associated infections caused by epidemiologically important pathogens (eg, vancomycin-resistant enterococcus [VRE]) via direct or indirect contact with patients. Based on ineffective components of routine contact isolations (eg, fewer healthcare provider visits), some studies have reported an association between the likelihood of adverse events and contact isolation. **Objective:** Given no strong evidence for this association due to most studies' invalid study designs and systematic misclassification, we compared adverse events between a VRE isolation cohort and a matched comparison cohort, using a propensity score matching cohort study design. **Methods**: This

Table 1.

Table 1. Group Comparisons Before and After Propensity Score Matching for Patients' Characteristics

Characteristics	Before matching			After matching		
	VRE isolation N=216	No isolation N=98,204	Standardized mean difference	VRE isolation N=141	No isolation N=141	Standardized mean difference
Length of stay	41.90 (53.35)	6.81 (9.28)	0.917	26.19 (28.89)	26.19 (28.89)	< 0.001
Age	67.43 (14.54)	56.84 (16.94)	0.671	67.13 (15.29)	67.43 (14.51)	0.020
Gender (F)*	123 (56.9)	51,593 (52.5)	0.089	69 (48.9)	59 (41.8)	0.143
Diabetes milletus (yes)*	63 (29.2)	14,669 (14.9)	0.348	35 (24.8)	34 (24.1)	0.016
Hypertension (yes)*	96 (44.4)	30,578 (31.1)	0.277	63 (44.7)	62 (44.0)	0.014
Albumin	2.90 (0.61)	3.86 (0.59)	1.602	3.16 (0.68)	3.10 (0.53)	0.092
Charlson comobidity index score	1.93 (2.40)	0.85 (1.54)	0.538	1.99 (2.94)	1.74 (2.23)	0.095
Braden scale score	16.63 (4.05)	20.95 (2.42)	1.294	17.45 (4.24)	17.75 (3.68)	0.075
Hendrich II fall risk model score	5.00 (3.20)	1.90 (2.38)	1.101	4.45 (3.23)	4.37 (3.11)	0.025

Note. Numbers are mean (standard deviations) except those maked with asterisks (*); *, number (%); VRE, vancomycin resistant enterococci

Table 2.

Table 2. Multivariable Cox Proportional Hazard Model Results for Decubitus Ulcer and Fall between VRE Isolation Cohort vs. Matched Comparison Cohort

Characteristics	Decubitus ulcer				Fall*			
	HR	95% C.I.		Pr > ChiSq	HR	95% C.I.		Pr > ChiSq
		Lower	Upper			Lower	Upper	
VRE isolation cohort (yes)	1.049	0.328	3.352	0.9357	0.418	0.051	3.439	0.4173
Age	1.029	0.982	1.079	0.2327	0.986	0.929	1.047	0.6558
Gender	1.169	0.364	3.758	0.7931	4.171	0.553	31.440	0.1659
Diabetes milletus (yes)	0.575	0.123	2.677	0.4804	0.227	0.008	6.413	0.3841
Hypertension (yes)	0.473	0.135	1.662	0.2430	2.064	0.303	14.073	0.4592
Albumin	0.694	0.255	1.885	0.4736	1.110	0.290	4.249	0.8786
Charlson comobidity index score	0.992	0.770	1.276	0.9478	0.890	0.591	1.340	0.5776
Braden scale score	0.883	0.739	1.055	0.1708	1.077	0.821	1.412	0.5927
Hendrich II fall risk model score	0.915	0.717	1.169	0.4779	1.204	0.876	1.656	0.2518

Note. * Firth correction method applied; HR, hazard ratio; C.I., confidence interval; VRE, vancomycin resistant enterococci

study was conducted at a 1,337-bed, tertiary-care, university-affiliated, Korean hospital equipped with a full electronic medical record (EMR) system for all patient records. With institutional review board approval, all relevant EMR records were extracted for the study period 2015–2017. All contact isolation information of VRE patients were confirmed through EMR manual review by 1 trained research nurse. For propensity score matching, risk factors for adverse events (ie, decubitus ulcer, fall, and cardiopulmonary resuscitation [CPR]) were selected based on literature reviews: length of stay, age, gender, diabetes mellitus, hypertension, albumin, Charlson comorbidity index, Braden scale score, and Hendrich II fall risk. For each VRE case, the 1:1 matched case was selected through the nearest neighbor matching with calculated propensity scores. The retrospective observation period was from the cohort entry date (ie, contact isolation start date) to the cohort exit date (ie, discharge or discontinue of contact isolation). A time-to-event analysis with a Cox proportional hazard model was conducted using SAS version 9.4 software. **Results:** Among the 98,527 inpatients (323 VRE positive; 98,204 VRE negative), the VRE cohort (N = 141 of 216, 65% of total VRE patients admitted to general wards without adverse event history before contact isolation) and the matched comparison (no isolation) cohort (N = 141, 0.1%) showed no differences in characteristic comparisons (Table 1). The Cox proportional hazard model was not applicable for CPR because no CPR case was available in the matched comparison cohort. The hazard ratios for adverse events showed no statistically significant difference for both cohorts: decubitus ulcer (hazard ratio [HR], 1.049; 95% CI, 0.328–3.352; fall (HR, 0.418; 95% CI, 0.051–3.349) (Table 2). **Conclusions:** Based on the full EMR records for 3 years, our propensity-score–matched cohort study reported no association between the likelihoods of adverse events and contact isolation.

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Poster Presentation

Evaluation of the Performance and Resource Needs of a Construction Infection Prevention and Control Program

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Background: The University Health Network (UHN) is a multisite, academic health sciences center in Toronto, Canada, with 1,300 inpatient beds and ~126,000 emergency department visits annually. Clinical services include a transplant program, cancer center, dialysis units, and rehabilitation sites. Currently, ~0.83 km^2 (>9 million ft^2) of UHN real estate, ~200 construction, renovation and maintenance projects are underway. The UHN Construction Infection Control Program (CICP) was created in 2012 and has expanded to include 3.5 FTEs to meet the needs of infection prevention oversight during these activities. We describe the performance indicators for the UHN CICP between May 2016 and December 2018 that have informed productivity and resource needs. **Methods:** Since 2016, construction infection preventionists (CIPs) have prospectively collected data on the frequency of activities reflecting CIP productivity and core job functions: number of meetings (attended and missed), site inspections, responses to breaches in control measures, education hours delivered, urgent requests, and after-hours work. Annual activity rates (frequency of activity divided by CIP months) were analyzed for trends, accounting for additions in CICP personnel over time. **Results:** Human resources and activities performed in the CICP from 2016 to 2018 are outlined in Table 1. As CICP human resources increased, the number of initiatives supported by the CICP team rose. Activity rates for attended meetings, inspections and hours of education provided increased with higher CIP resources, suggesting an improvement in individual productivity of each CIP (Fig. 1). Concurrently, the rate of missed meetings declined and after-hour requests and breach responses remained stable. **Conclusions:** An appropriately staffed CICP for the volume and risk level of organization-wide construction, renovation, and maintenance activities is crucial to infection prevention. We developed performance indicators based upon key functions of CIPs to evaluate the productivity of our team and ensure we had adequate human resources to maintain patient safety through our evolving needs.

Table 1. Structure and Function of Construction Infection Control Program, May 2016–December 2018

Activity	2016	2017	2018
CIPs, no.[a]	1	1.5	3.5
CIP months, no.[b]	8	15	35
Meetings, no.	448	1,134	3,386
Missed meetings, no.	82	584	727
Inspections, no.	292	930	2,266
Breach responses, no.	16	47	138
Education hours, no.	0	127	966
Urgent requests, no.	0	135	924
After-hours work requests, no.	0	11	224

[a]CIP, construction infection preventionists; measured at end of calendar year.[b]Number of months of data contributed by CIP complement.

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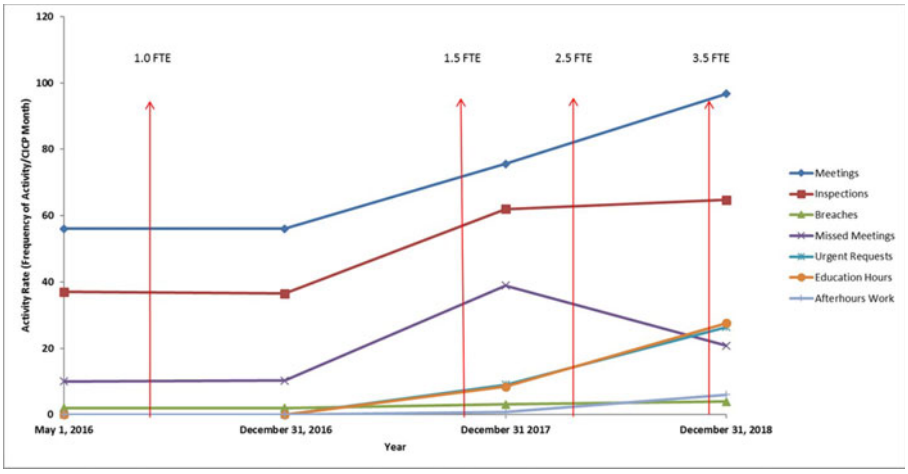

Fig. 1 Annual activity rate by activity type.