Fig. 1

hospitalization-related fluoroquinolone days by 2017. Between 2014 and 2017, fluoroquinolone use decreased in VA hospitals, largely driven by a decrease in inpatient fluoroquinolone (especially ciprofloxacin) use. Fluoroquinolone prescribing at discharge, and levofloxacin prescribing overall, remain prime targets for stewardship.

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Presentation Type:
Poster Presentation

Misdiagnosis of Urinary Tract Infection Linked to Misdiagnosis of Pneumonia: A Multihospital Cohort Study

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Background: Clinicians often diagnose bacterial infections such as urinary tract infection (UTI) and pneumonia in patients who are asymptomatic or have nonbacterial causes of their symptoms. Misdiagnosis of infection leads to unnecessary antibiotic use and potentially delays correct diagnoses. Interventions to improve diagnosis often focus on infections separately. However, if misdiagnosis is linked, broader interventions to improve diagnosis may be more effective. Thus, we assessed whether misdiagnosis of UTI and community-acquired pneumonia (CAP) was correlated. **Methods:** From July 2017 to July 2019, abstractors at 46 Michigan hospitals collected data on a sample of adult, non–intensive care, hospitalized patients with bacteriuria (positive urine culture) or who were treated for presumed CAP (discharge diagnosis plus antibiotics). Patients with concomitant bacterial infections were excluded. Using a previously described method,[1,2] patients were assessed for UTI or CAP based on symptoms, signs, and laboratory or radiology findings. Misdiagnosis of UTI was defined as patients with asymptomatic bacteriuria (ASB) treated with antibiotics number of patients with bacteriuria Misdiagnosis of CAP was defined as patients treated for presumed CAP who did not have CAP number of patients treated for presumed CAP. Hospital-level correlation was assessed using Pearson's correlation coefficient between misdiagnosis of UTI and CAP. For patients with prescriber data (N = 3,293), we also assessed emergency department (ED)-level correlation. **Results:** Of 11,914 patients with bacteriuria, 31.9% (N = 3,796) had ASB. Of those, 2,973 of 3,796 (78.3%) received antibiotics. Of 14,085 patients treated for CAP, 1,602 (11.4%) did not have CAP. Incidence of misdiagnosis varied by hospital: those with high rates of misdiagnosis of UTI were more likely to have high rates of misdiagnosis of CAP (Pearson's correlation coefficient, 0.58; $P \leq .001$) (Fig. 1). Of 2,137 patients misdiagnosed with UTI, 1,159 (54.2%) had antibiotic treatment started in the ED; of those, 942 (81.3%) remained on antibiotics on day 3 of hospitalization. Of 1,156 patients misdiagnosed with CAP, 871 (75.3%) had antibiotic therapy started in the ED, and 789 of these 871 patients (90.6%) were still on antibiotics on day 3 of hospitalization. Hospitals with high rates of UTI misdiagnosis in the ED were more likely to have high rates of CAP misdiagnosis in the ED (Pearson's correlation coefficient, 0.33; $P \leq .001$). **Conclusions:** Misdiagnosis of 2 unrelated infections was moderately correlated by hospital and weakly correlated by hospital ED. Potential causes include differences in organizational culture (eg, low tolerance for diagnostic uncertainty, emergency department culture), organizational initiatives (eg, sepsis, stewardship), or coordination between emergency and hospital medicine. Additionally, antibiotics initiated in the ED were typically continued following admission, potentially reflecting diagnosis momentum.

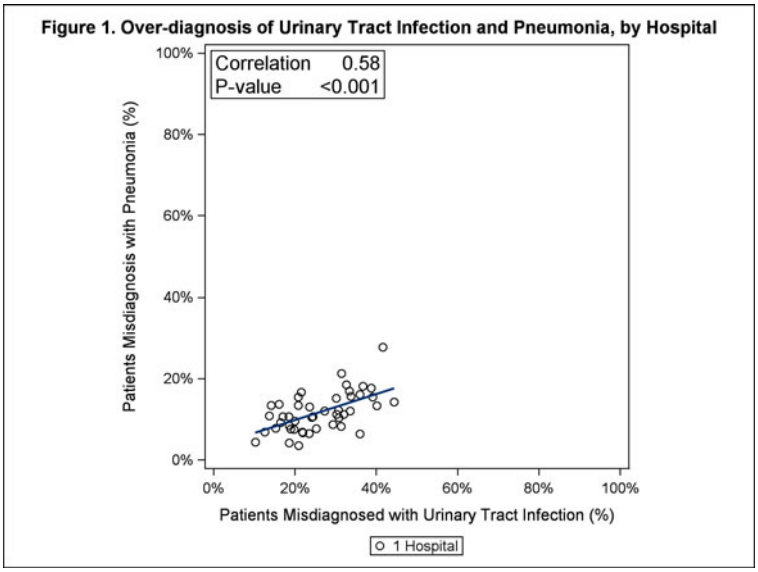

Fig. 1

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Molecular Epidemiology and Outcomes of Patients with Carbapenem-Resistant Enterobacteriaceae Bacteriuria, Atlanta 2012–2015

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Background: Carbapenem-resistant *Enterobacteriaceae* (CRE) represent a significant antibiotic resistance threat, in part because carbapenemase genes can spread on mobile genetic elements. Here, we describe the molecular epidemiology and outcomes of patients with CRE bacteriuria from the same city in a nonoutbreak setting.
Methods: The Georgia Emerging Infections Program performs active, population-based CRE surveillance in Atlanta. We studied a cohort of patients with CRE (resistant to all tested third-generation cephalosporins and ≥1 carbapenem, excluding ertapenem) first identified in urine, and not in a prior or simultaneous sterile site, between 2012 and 2015. Whole-genome sequencing (WGS) was performed on a convenience sample. We obtained epidemiologic and outcome data through chart review and Georgia Vital Statistics records (90-day mortality). Using WGS, we created a core-genome alignment-based phylogenetic tree of the *Klebsiella pneumoniae* isolates and calculated the SNP difference between each sample. Using SAS version 9.4 software, we performed the Fisher exact test and univariable odds ratios (OR) with 95% CI to compare patient isolates with and without a carbapenemase gene. **Results:** Among 81 patients included, the median age was 68 (IQR, 57–74) years, and most were female (58%), black (60%), and resided in a long-term care facility 4 days prior to culture isolation (53%). Organisms isolated were *K. pneumoniae* (84%), *Escherichia coli* (7%), *Enterobacter cloacae* (7%), and *Klebsiella oxytoca* (1%). WGS identified at least 1 β-lactamase gene in 91% of the isolates; 85% contained a carbapenemase gene, the most frequent of which was *bla*KPC-3 (94%). Patients with CRE containing a carbapenemase gene were more likely to be black (OR, 3.7; 95% CI, 1.0–13.8) and to have *K. pneumoniae* (OR, 8.9; 95% CI, 2.2–35.0). Using a core-genome alignment of 3,708 genes (~63% of the complete genome), we identified a median of 67 (IQR, 23–3,881) SNP differences between each *K. pneumoniae* isolate. A phylogenetic tree identified clustering around carbapenemase gene and multilocus sequence type (84% were ST 258) but not based on referring laboratory or county of residence (Fig. 1). Although 7% of patients developed an invasive CRE infection within 1 year and 21% died within 90 days, having a