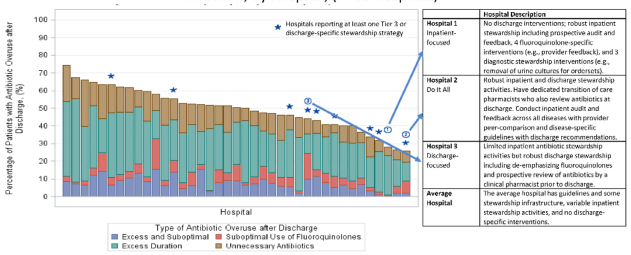
Figure 2. Antibiotic Overuse after Discharge in Patients Treated for Pneumonia or Urinary Tract Infection, by Hospital, (N=39 hospitals)



of antibiotic overuse at discharge. Days of antibiotic overuse at discharge were defined based on national guidelines and included unnecessary therapy, excess duration, and suboptimal fluoroquinolone use. We evaluated the association of stewardship strategies with days of discharge antibiotic overuse 2 ways: (1) all stewardship strategies were assumed to have equal weight, and (2) strategies weighted using the ROAD Home Framework with tier 3 (discharge-specific) strategies had the highest weight. **Results:** Overall, 39 hospitals with 20,444 patients (56.5% CAP; 43.5% UTI) were included. The survey response rate was 100% (39 of 39). Hospitals reported a median of 12 (IQR, 9–14) of 33 possible stewardship strategies (Fig. 1). On bivariable analyses, review of antibiotics prior to discharge was the only strategy consistently associated with lower antibiotic overuse at discharge (aIRR, 0.543; 95% CI, 0.335–0.878). On multivariable analysis, weighting by ROAD Home tier predicted antibiotic overuse at discharge for both CAP and UTI. For diseases combined, having more weighted strategies was associated with lower antibiotic overuse at discharge (aIRR per weighted intervention, 0.957; 95% CI, 0.927–0.987). Discharge-specific stewardship strategies were associated with a 12.4% relative decrease in antibiotic overuse days at discharge. Based on these findings, 3 pathways emerged to improve antibiotic use at discharge (Fig. 2): inpatient-focused strategies, "doing it all," and discharge-focused strategies. **Conclusions:** The more stewardship strategies reported, the lower a hospitals' antibiotic overuse at discharge. However, different pathways to improve discharge antibiotic use exist. Thus, discharge stewardship strategies should be tailored. Specifically, hospitals with limited stewardship resources and infrastructure should consider implementing a discharge-specific strategy straightaway. In contrast, hospitals that already have substantial inpatient infrastructure may benefit from proactively incorporating discharge into their existing strategies.

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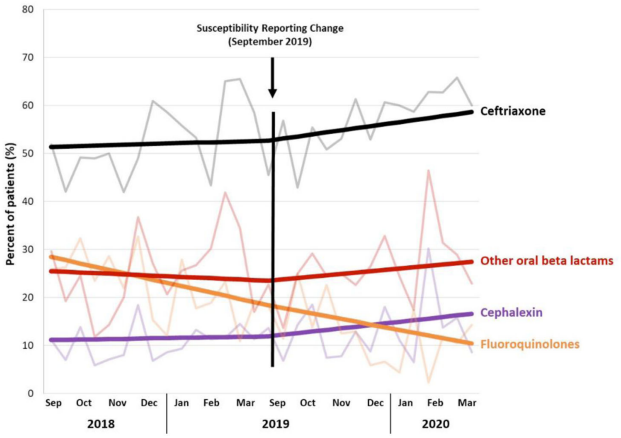
Presentation Type:
Poster Presentation - Top Oral Abstract
Subject Category: Surveillance/Public Health

Susceptibility reporting and antibiotic prescribing for UTIs in the inpatient setting: A nudge toward improved stewardship

Madison Ponder; Alan Kinlaw; Lindsay Daniels; Ashlyn Norris and Kevin Alby

Background: Urinary tract infections (UTIs) are common in the inpatient, observation, and emergency department settings. Although many UTI-causing pathogens are susceptible to oral β-lactams, these agents are not tested directly, and susceptibility is extrapolated from other agents. To improve the use of these agents, the University of North Carolina Medical Center (UNCMC) added cephalexin to the susceptibility profile generated with urine culture results in the electronic health record (EHR). We evaluated prescribing trends of cephalexin, other oral β-lactams, fluoroquinolones, and other antibiotics for UTIs in the inpatient setting, before and after the susceptibility reporting change. **Methods:** An interrupted time-series analysis was conducted. Among 1,491 patients who had positive urine cultures with susceptibilities and received at least

Figure 1. Segmented trends (bold lines) and raw data (faded) for percent of patients receiving antibiotic class before and after the September 2019 EHR-based intervention, for cephalexin (purple), other oral beta lactams (red), ceftriaxone (black), fluoroquinolones (orange).



1 antibiotic with a listed UTI indication during their inpatient stay at UNCMC, we measured the weekly prevalence (%) of patients who received each antibiotic group: cephalexin, other oral β-lactams (amoxicillin-clavulanate, cefdinir, cefuroxime), fluoroquinolones (levofloxacin, ciprofloxacin), and ceftriaxone. The study comprised a preintervention period (September 2018–March 2019) and a postintervention period (September 2019–March 2020). The prevalence of each antibiotic or group was plotted over time, and segmented linear regression was used to estimate the impact of the intervention on each antibiotic groups' time trend. **Results:** At study baseline in September 2018, the weekly prevalence of antibiotic use was 11% for cephalexin, 26% for other oral β-lactams, 51% for ceftriaxone, and 29% for fluoroquinolones. Fluoroquinolone use decreased steadily throughout the study period, by 11% during the 7-month preintervention period (95% CI, −17% to −5%) and by 8% (95% CI, −13% to −3%) after the intervention (*P* for trend deflection, .70). In contrast, during the preintervention period, trends were flat for cephalexin, ceftriaxone, and other oral β-lactams (all *P* for nonzero preintervention slope were >.40). During the postintervention period, use increased for ceftriaxone (6%; 95% CI, 3%–9%). Post-intervention use also increased for cephalexin (5%; 95% CI, −3% to 12%) and other oral β-lactams (4%; 95% CI, −8%, 15%), but these trends were imprecise and not statistically significant at α = .05. Fig. 1 displays trends and raw data for each antibiotic group. **Conclusions:** The urine culture susceptibility reporting change was associated with small increases in cephalexin and ceftriaxone use, coincident with continued decreasing use of fluoroquinolones, for hospitalized patients with positive urine cultures and a listed UTI indication. Low-resource EHR-based interventions may confer considerable benefit for antimicrobial stewardship efforts in this clinical setting, and larger real-world studies are needed to replicate and contextualize these findings.

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Presentation Type:
Poster Presentation - Top Oral Abstract
Subject Category: *C. difficile*

Impact of exposure to potentially contaminated hospital beds on risk of hospital-onset *C. difficile* infection

Lucy Witt; Jessica Howard-Anderson; Elizabeth Overton and Jesse Jacob

Background: Environmental contamination increases risk for *Clostridioides difficile* infection (CDI) given that spores can remain on a hospital bed, floor, sink, and light switch despite appropriate cleaning

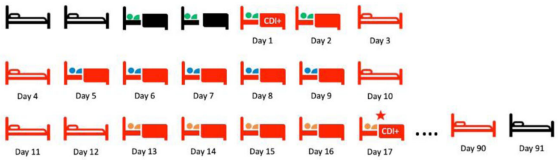

Figure 1. ***Exposure to a C. difficile "contaminated" bed.*** *Beds are considered contaminated starting with the positive C difficile test of an occupant (green occupant). The bed remains contaminated for 90 days in this figure. Subsequent patients were only considered to have an associated HO-CDI if they developed their infection within seven days of occupying a contaminated bed and after at least three days in the hospital (orange occupant). Occupants were required to have spent only one night in a contaminated bed to have an associated CDI. The blue occupant did not develop CDI.*

Table 1. Patient Characteristics

	Total encounters (n = 25,032)
Age, median (IQR)	61 (47-71)
Female, n (%)	12,938 (51.7)
Race	
Black	13,231 (52.9)
White	10,373 (41.4)
Other, unknown	1,428 (5.7)
Hospital	
A	13,836
B	11,196
Hospital length of stay	5 (4-9)
ICU length of stay	3 (2-6)
Elixhauser comorbidity score, median (IQR)	4 (2-5)
Received antibiotics (excluding oral vancomycin)	16,596 (66.3)
Received proton pump inhibitor	11,199 (44.7)

Table 2. Odds of C diff following exposure to a contaminated bed at 90 (primary analysis), 60, 30, 14 and 7 days (sensitivity analyses)

	90 days		60 days		30 days		14 days		7 days	
	Unadj OR (95% CI)	Adj OR (95% CI)	Unadj OR (95%)	Adj OR (95%)	Unadj OR (95%)	Adj OR (95%)	Unadj OR (95%)	Adj OR (95%)	Unadj OR (95%)	Adj OR (95%)
Exposure to contaminated bed*	1.77 (1.36 - 2.31)	1.60 (1.22 - 2.08)	1.64 (1.23 - 2.19)	1.47 (1.10 - 1.97)	1.85 (1.4 - 2.71)	1.75 (1.25 - 2.43)	1.97 (1.30 - 3.00)	1.75 (1.15 - 2.67)	2.03 (1.20 - 3.44)	1.77 (1.04 - 3.00)
Age >65 years	1.01 (0.78 - 1.33)	0.86 (0.66 - 1.13)	1.01 (0.78 - 1.31)	0.86 (0.66 - 1.12)	1.01 (0.78 - 1.31)	0.86 (0.66 - 1.12)	1.16 (1.10 - 1.23)	0.86 (0.66 - 1.12)	1.01 (0.78 - 1.31)	0.85 (0.66 - 1.11)
Elixhauser comorbidity score	1.16 (1.10 - 1.23)	1.16 (1.09 - 1.23)	1.16 (1.10 - 1.23)	1.16 (1.10 - 1.23)	1.16 (1.1 - 1.23)	1.16 (1.10 - 1.23)	1.01 (0.78 - 1.31)	1.16 (1.10 - 1.23)	1.16 (1.10 - 1.23)	1.16 (1.10 - 1.23)
Received antibiotics	3.29 (2.26 - 4.77)	3.26 (2.24 - 4.74)	3.29 (2.26 - 4.77)	3.28 (2.26 - 4.77)	3.29 (2.26 - 4.77)	3.27 (2.25 - 4.76)	3.29 (2.26 - 4.77)	3.28 (2.25 - 4.77)	3.29 (2.26 - 4.77)	3.29 (2.26 - 4.78)
Received PPI	1.70 (1.31 - 2.20)	1.43 (1.10 - 1.86)	1.70 (1.31 - 2.20)	1.44 (1.11 - 1.88)	1.70 (1.31 - 2.20)	1.44 (1.11 - 1.88)	1.70 (1.31 - 2.20)	1.45 (1.11 - 1.88)	1.70 (1.31 - 2.20)	1.46 (1.12 - 1.89)

* Defined as being contaminated for 90, 60, 30, 14 or 7 days after positive C. difficile test of prior occupant

measures. Using real-time asset management software (AgileTrac, GE Healthcare) for beds we examined the risk of a patient developing hospital-onset CDI (HO-CDI) when staying in a hospital bed that had a previous occupant with CDI. **Methods:** We retrospectively identified all patients in tracked beds from April 2018 to August 2019 to identify hospital-onset CDI (HO-CDI), defined as a positive PCR test for *C. difficile* in a patient hospitalized for >3 days. A patient was defined as being exposed to a potentially "contaminated" bed if within the preceding 7 days from their HO-CDI diagnosis they resided in a hospital bed that, within the prior 90 days, had held an occupant with CDI (Fig. 1). We used multivariable logistic regression to evaluate the association between being exposed to a contaminated bed and HO-CDI. Model covariates were chosen a priori based on known risk factors for CDI. As a sensitivity analysis, we varied the length of time that a bed could stay contaminated from 90 to 60, 30, 14, and 7 days. **Results:** We analyzed 25,032 hospital encounters representing 18,860 unique patients; we identified 237 (0.9%) hospital encounters with HO-CDI (Table 1). The Elixhauser comorbidity score, being exposed to a contaminated bed, and receiving antibiotics or a proton pump inhibitor (PPI) during the hospital admission were all associated with HO-CDI in the univariable analysis (Table 2). In the adjusted multivariable model, being exposed to a contaminated bed remained a significant risk factor for HO-CDI (OR, 1.60; 95% CI, 1.22–2.08) even after controlling for known risk factors for CDI including age >65, elevated Elixhauser score, and recent antibiotic or PPI use (Table 2). In the sensitivity analysis in which we adjusted the time a bed was considered contaminated after CDI, being exposed to a contaminated bed remained a risk factor for HO-CDI, with a similar odds ratios as the original model (Table 2). **Conclusions:** Residing in a hospital bed that contained a previous occupant with CDI is a risk factor for developing HO-CDI. Hospital epidemiologists, infection control personnel, and environmental services staff should consider this association when developing CDI risk mitigation strategies.

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Presentation Type:
Poster Presentation - Top Oral Abstract
Subject Category: CLABSI

Assessment of risk factors associated with outpatient parenteral antimicrobial therapy complications

Christina Kaul; Jenny Yang; Matthew Haller; Sadie Solomon; Yaojie Wang; Rong Wu; Yu Meng; Robert Pitts and Michael Phillips

Background: Outpatient parenteral antimicrobial therapy (OPAT) is used in the outpatient setting to treat infectious conditions that require a prolonged course of antimicrobials. OPAT has been shown to decrease length of hospital stay and healthcare costs without compromising patient care and has become a widely accepted practice nationally. Due to this trend, the study of OPAT is of vital importance and will continue to be relevant moving forward. Currently, few studies have explored risk factors associated with OPAT complications, and most are limited in their analysis by indication. Further work should be performed to expand upon what is currently known. We characterized factors associated with increased OPAT complication risk. **Methods:** We conducted a retrospective cohort study at 4 sites across NYU Langone Health in patients admitted from 2017 to 2020. We applied the following inclusion criteria: aged ≥18 years and discharged with OPAT. Complications were defined as follows: vascular-access-related (line occlusion, thrombosis, dislodgement, central-line associated bloodstream infection or CLABSI) and antimicrobial-related (laboratory derangement, drug reaction, *Clostridioides difficile* infection), all-cause 30-day readmission, and OPAT-related readmission. Data were obtained from electronic medical records and the OPAT database. This study was granted a waiver from informed consent by the NYU Institutional Review Board. Multivariate logistic regression was performed, adjusting for confounding variables (sex, age, hospital of admission, history of chronic medical conditions, line type, and line duration). **Results:** Overall, 1,846 patient encounters of 5,951 reviewed met inclusion criteria. The median age was 66 (IQR, 26), 42.2% were female. Moreover, 810 (44%) received a peripherally inserted central catheter (PICC) and 1,036 (56%) received a midline cathether. Also, 563 (30.5%) were discharged to subacute rehabilitation (SAR). The most frequent complications were line dislodgement (4.2% of all patients), laboratory derangement (3.0%), and drug reaction (2.4%). Furthermore, 27 patients (1.5%) developed CLABSI. Patients discharged to SAR were more likely to develop CLABSI (OR, 4.1l; P = .005), and they had higher rates of OPAT-related 30-day readmissions (OR, 2.675; P = .004) compared to those who were discharged home, after adjusting for key confounders. **Conclusions:** Discharge to SAR is strongly associated with increased risk of readmission for OPAT-related complications and CLABSI, after adjusting for key confounders. CLABSI prevention during SAR admission is a critically needed public health intervention.

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