

who may require antibiotics but do not require hospital admission. In this study, we described the characteristics and proportion of antibiotic prescription in patients evaluated in and discharged from the ED with ARI. **Methods:** We performed a retrospective chart review of patients diagnosed with ARI and discharged from a single academic ED between January 2018 and January 2020. We compared those for whom a PCT test was ordered to those without a PCT test ordered at ARI diagnosis. Charts were reviewed until there were 110 subjects in each of the 2 study groups. The main outcome variable was receipt of an antibiotic prescription. The χ^2 test was used to compare the proportion of patients who received an antibiotic prescription, demographics, and clinical characteristics between the 2 groups. The Mann-Whitney *U* test was used to compare the distribution of ages between the 2 groups. **Results:** Among patients in the PCT group, 87 (79.0%) received antibiotics versus 69 (62.7%) in the non-PCT group ($P \pm 18.8$ vs 52.7 years ± 17.6 ; $P = .0002$); more likely to have preexisting heart and lung disease (28.2% vs 15.5%; $P = .02$); more often male (58.2% vs 40%; $p < 0.01$); had more subjective fevers (47.3% vs 33.6%, $p = 0.04$), sputum production (49.1% vs 28.2%, $p < 0.01$), and nausea (17.3% vs 8.2%, $p = 0.04$). PCT results were low (≤ 0.25) in 82.7% (91) of patients, of whom 70.3% (64) received antibiotics. **Conclusions:** Patients for whom PCT testing was ordered were older, had more underlying conditions and increased severity of illness. This finding may reflect that PCT testing was more likely to be ordered in patients at risk of severe infection but not requiring admission. The proportion of antibiotics prescriptions was higher for patients who had a PCT test. For patients with a low PCT result, the proportion of patients prescribed antibiotics was high. This finding may suggest that clinical characteristics were more influential than PCT result in the decision to prescribe antibiotics. More research is needed on the role of PCT testing in antibiotic prescription decisions for patients presenting to the ED with ARI.

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Analysis of Recurrent Urinary Tract Infection Management in Outpatient Settings Reveals Opportunities for Antibiotic Stewards

Marissa Valentine-King; Barbara Trautner; Roger Zoorob; George Germanos; Jason Salemi; Kalpana Gupta and Larissa Grigoryan

Background: Studies of antibiotic prescribing choice and duration have typically excluded women with recurrent UTI (rUTI), yet the Infectious Disease Society of America (IDSA) UTI treatment guidelines are applicable to recurrent and sporadic cystitis. We sought to better understand prescribing practices among uncomplicated rUTI patients in terms of choice of drug, duration of therapy, and the risk factors for receiving guideline-discordant therapy. **Methods:** We performed a retrospective database study by extracting electronic health record data from adults seen at academic primary care, internal medicine, or urology practices between November 2016 and December 2018. Inclusion criteria included having ≥ 2 or ≥ 3 *International Classification of Diseases Tenth Edition* (ICD-10) cystitis codes recorded within a 6- or 12-month period, respectively. We excluded patients with ICD-10 codes indicating any structural or functional genitourinary comorbidities, interstitial cystitis, vaginosis, compromised immune systems, or pregnancy in the prior year. Patients were also excluded if they had signs or symptoms of pyelonephritis at presentation. **Results:** Overall, 232 patients presented for 597 outpatient visits. Most were married (52.2%), non-Hispanic white (62.9%), and female (92.2%), with a median age of 58 years (IQR, 41–68). Only 21% of visits with an antibiotic prescribed for treatment consisted of a first-line therapy agent prescribed for the recommended duration. In terms of antibiotic choice, these agents were prescribed in 58.4% of scenarios, which primarily included nitrofurantoin (37.8%) and trimethoprim-sulfamethoxazole (TMP-SMX) (20.3%). Guideline-discordant choices of fluoroquinolones (28.8%), and β -lactams (11.2%) were the

second and third most commonly prescribed drug categories, respectively. Multinomial logistic regression identified age (OR, 1.02; 95% CI, 1.002–1.04) or having a telephone visit (OR, 3.17; 95% CI, 1.54–6.52) as independent risk factors for receiving a β -lactam. The duration exceeded the 3-day guideline recommendation in 87.6% of fluoroquinolones and 73% of TMP-SMX (73%) prescriptions, and 61% of nitrofurantoin prescriptions exceeded the recommended 5-day duration. Multiple logistic regression analysis revealed that seeking care at a urology clinic (OR, 2.81; 95% CI, 1.59–5.17) served as an independent factor for therapy duration exceeding guideline recommendations. **Conclusions:** This retrospective study revealed shortcomings in prescribing practices in the type and duration of therapy for rUTI. rUTI as well as sporadic UTI are important targets for outpatient antibiotic stewardship interventions.

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Blood Culture Utilization at Six Southeastern US Hospitals

Bobby Warren; Rebekah Moehring; Michael Yarrington; Deverick Anderson and Christopher Polage

Group Name: Duke Center for Antimicrobial Stewardship and Infection Prevention

Background: Blood cultures are an essential diagnostic test, but over- and underutilization may cause harm. **Methods:** We analyzed blood culture utilization at 6 hospitals in the southeastern United States including 1 academic hospital (A) and 5 community hospitals (B–F) from May 2019 to April 2020. We measured blood culture utilization rate (BCUR) per 1,000 patient days and blood cultures per encounter. We counted blood cultures by laboratory accession number and measured utilization per 1,000 patient days and encounter. A likely contaminant was defined as 1 of 2 blood cultures collected in the same calendar day positive for a common skin commensal (CSC), as defined by the NHSN, and not identified from subsequent cultures. A likely pathogen was defined as a culture with a pathogen not on the CSC list or a CSC not meeting the contaminant definition. Hospital-level BCUR included samples for culture collected in the emergency department (ED) and inpatient areas divided by inpatient days. **Results:** The analysis included 117,897 blood cultures and 662,723 patient days with a median BCUR of 209.7 per hospital and median blood culture per encounter of 2 (Table 1). One community hospital (C) demonstrated a substantially higher BCUR than others. Cultures were frequently collected in the ED (54%; range, 36%–78%); most encounters with cultures in the ED

Table 1.

Hospital	A	B	C	D	E	F
BCUR per 1000 patient days	150.1	199.2	534.8	237	117.1	220.1
BCUR by Inpatient Unit Type						
Intensive Care	221	128.8	NA	108.7	137.4	156.5
ONC/Transplant	134.2	66.2	NA	NA	114.1	NA
Medical/Surgical	69.9	47.2	203.7	66	62.5	56.6
Pediatric Intensive Care	82.6	NA	NA	NA	1.6	1.3
Mixed Acuity	NA	45.9	105.9	51.5	40.8	23.6
Pediatric Medical/Surgical	35.5	46.2	NA	56.7	NA	NA
Labor and Delivery	8.1	19.6	155.7	5.4	2.6	6
Other	184.5	NA	NA	NA	NA	NA
N Blood Cultures	46453	7631	14624	13600	17164	18425
Percent in ED	35.7%	70.6%	63.3%	73.9%	46.3%	78.0%
Median Blood Cultures Per Encounter (IQR)	2 (2-2)	2 (2-3)	4 (3-4)	2 (2-2)	2 (2-2)	2 (2-2)
Percent with likely pathogen	8.2%	4.5%	7.0%	9.0%	9.1%	5.9%
Percent with likely contaminant	1.6%	1.9%	3.1%	3.2%	1.3%	2.5%
Percent of first blood cultures drawn after antibiotics	6.1%	5.3%	3.4%	5.9%	9.0%	5.8%

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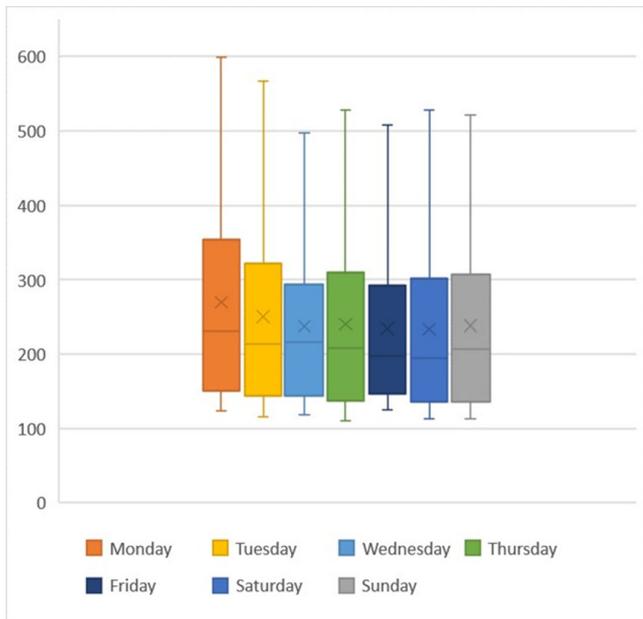


Figure 1.

were subsequently admitted to an inpatient unit (84%; range, 73%–89%). Higher BCURs were observed in intensive care and oncology units. The proportion of first blood cultures drawn after initiation of antibiotics was 6% (range, 3%–9%). Mondays had higher BCURs than other days of the week (Figure 1). The average BCUR by month was 176.1 (range, 164.3–181.4) with no seasonal patterns observed. Overall, 7.7% (range, 4.5%–9.1%) of blood cultures identified a likely pathogen and 2.1% (range, 1.3%–3.2%) identified a likely contaminant. The 3 hospitals with BCURs >200 also had contaminant rates >2% and >60% ED cultures. **Conclusions:** Blood culture utilization varied by hospital, unit, and day of the week. We observed higher rates of likely contaminants among hospitals with higher BCURs and ED culture rates. Comparisons may assist in identifying opportunities to optimize practice around blood-culture ordering and collection.

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Outpatient Antibiotic Use for Common Infectious Diagnoses: Patterns in Telehealth During the Emergence of COVID-19

Brigid Wilson; Taissa Bej; Sunah Song; Janet M Briggs; Richard Banks; Robin Jump; Federico Perez and Ukwen Akpoji

Background: The influence of increased use of telehealth during the emergence of COVID-19 on antibiotic prescriptions in outpatient settings is unknown. The VA Northeast Ohio Healthcare System has 13 community-based outpatient clinics (CBOCs) that provide primary and preventive care. We assessed changes in antibiotic prescriptions that occurred as care shifted from in-person to telehealth visits. **Methods:** Using VHA administrative databases, we identified all primary care CBOC visits between January 1, 2019, and December 31, 2020, that included a diagnosis for an acute respiratory infection (ARI), a urinary tract infection (UTI), or a skin or soft-tissue infection (SSTI), excluding visits with >1 of these diagnoses or with additional infectious diagnoses (eg, pneumonia, influenza). We summarized the proportion of telehealth visits and the proportion of patients prescribed antibiotics at quarterly intervals. We specifically assessed outpatient visits from April to December 2019 compared to the

Table 1: Patient Characteristics, Visit Types and Proportion with Antibiotic Prescriptions from April – December 2019 vs. 2020.

	April – December 2019		April – December 2020	
	Without antibiotics (n = 1164 visits)	With antibiotics (n = 1845 visits)	Without antibiotics (n = 633 visits)	With antibiotics (n = 497 visits)
Male sex, No. (%) ^a	1013 (87%)	1576 (85%)	532 (84%)	417 (84%)
Age, mean (± SD) ^b	62.8+/-16.8	61.2+/-15.2	63.2+/-18	61.5+/-16
Race/Ethnicity				
White non-Hispanic	969 (83%)	1534 (83%)	537 (85%)	413 (83%)
Black non-Hispanic	118 (10%)	219 (12%)	64 (10%)	58 (12%)
Hispanic	29 (2%)	21 (1%)	9 (1%)	8 (2%)
Other ^c	48 (4%)	71 (4%)	23 (4%)	18 (4%)
Charlson Comorbidity Index, mean (± SD) ^b	0.9+/-1.4	0.9+/-1.4	1.16+/-1.7	1.09+/-1.7
Infectious Disease ICD10 codes				
ARI (in-person)	687 (59%)	1303 (71%)	61 (10%)	82 (16%)
ARI (telehealth)	99 (9%)	63 (3%)	213 (34%)	153 (31%)
UTI (in-person)	171 (15%)	147 (8%)	46 (7%)	28 (6%)
UTI (telehealth)	53 (5%)	47 (3%)	162 (26%)	99 (20%)
SSTI (in-person)	128 (11%)	260 (14%)	55 (9%)	97 (20%)
SSTI (telehealth)	26 (2%)	25 (1%)	96 (15%)	38 (8%)

^aAll values written as No. (%) unless otherwise indicated;

^bSD, standard deviation;

^cFor includes patients with race indicated as American Indian, Alaska Native, Asian, Native Hawaiian or Pacific Islander and unknown; and patients with Ethnicity unknown.

Figure 1. The number of in-person (red) and telehealth (blue) outpatient visits associated with diagnoses for ARI, UTI, and SSTI from January 2019 through December 2020.

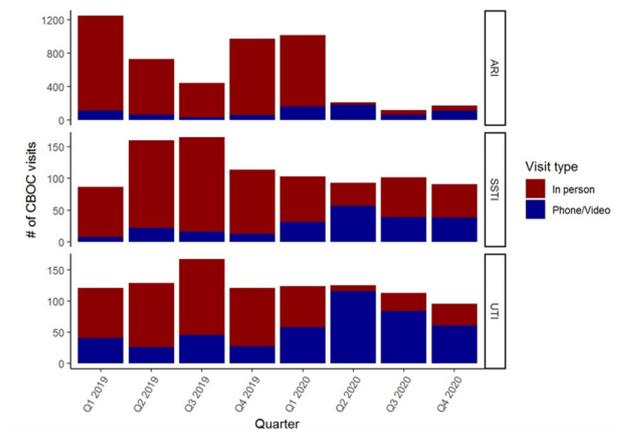


Figure 1.

Figure 2. The proportion of in-person (red) and telehealth (blue) outpatient visits for ARI, UTI, or SSTI that included an antibiotic prescription from January 2019 through December 2020.

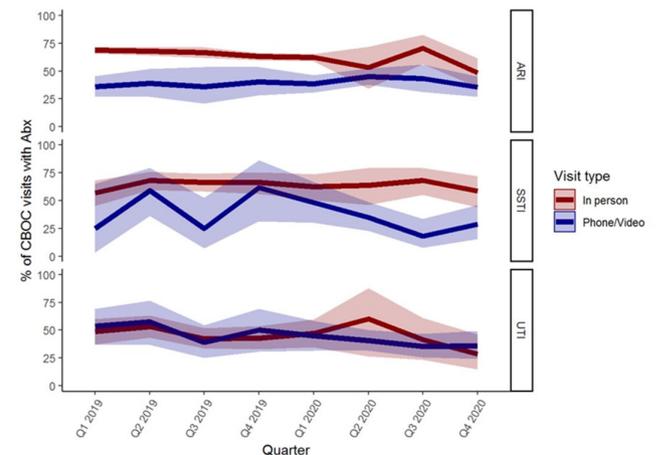


Figure 2.

same months in 2020 to account for seasonality while analyzing diagnosis and antibiotic trends in the emergence of the COVID-19 pandemic. **Results:** The patients receiving care in April–December 2019 compared to April–December 2020 were similar (Table 1). From April through December 2019, 90% of CBOC primary care visits with a diagnosis for