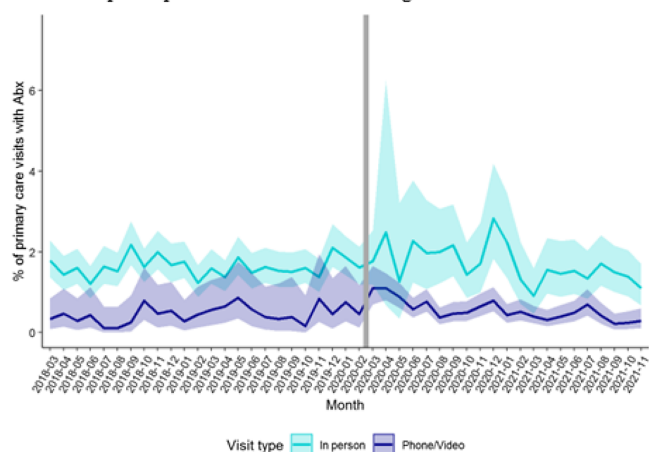


Figure 2. Percentage of in-person (light blue) and telehealth (dark blue) primary care visits at a large VA medical center accompanied by an antibiotic prescription from March 2018 through November 2021.



The proportions of visits with an antibiotic prescription were 1.4% (1,212 of 88,565) and 0.8% (798 of 94,396), respectively. When considered by the type of visit, the rates of antibiotics prescribed were consistent during the pre-COVID-19 and COVID-19 periods, with a lower rate for telehealth visits (Fig. 2). In both periods, >50% of antibiotic prescriptions occurred during visits without an associated infectious disease diagnosis. **Conclusions:** Compared to the pre-COVID-19 period, primary care providers at a large VA medical center prescribed fewer antibiotics during the COVID-19 period, and they saw most of their patients via telehealth. These results suggest that some aspects of telehealth may support clinical practices consistent with antibiotic stewardship. The prescription of an antibiotic without an associated diagnostic code also suggests opportunities to improve implementation of antibiotic stewardship principles in primary care settings.

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Presentation Type:

Poster Presentation - Top Poster Award

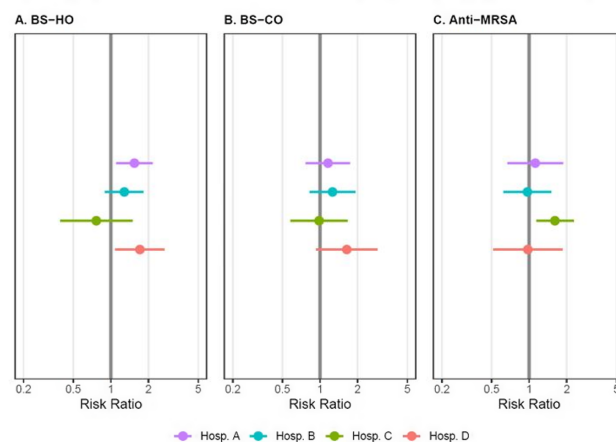
Subject Category: Antibiotic Stewardship

Do hospitalists who prescribe high (risk-adjusted) rates of antibiotics do so repeatedly?

Udodirim Onwubiko; Christina Mehta; Zanthia Wiley; Jesse Jacob; Ashley Jones; Shabir Hassan; Marybeth Sexton; Sujit Suchindran and Scott Fridkin

Background: Provider-specific prescribing metrics can be used for benchmarking and feedback to reduce unnecessary antibiotic use; however, metrics must be credible. To improve credibility of a recently described risk-adjusted antibiotic prescribing metric for hospital medicine service (HMS) providers, we assessed whether providers who initially prescribed excess antibiotics continued to prescribe antibiotics excessively. **Methods:** We linked administration and billing data among patients at 4 acute-care hospitals (1,571 beds) to calculate days of therapy (DOT) ordered by individual hospitalists for each of 3 NHSN antibiotic groupings: broad-spectrum hospital onset (BS-HO), broad-spectrum community-onset (BS-CO), or anti-MRSA for each patient day billed from January 2020 to June 2021. To incorporate repeated measures by provider, mixed models adjusted for patient-mix characteristics (eg, % encounters with urinary tract infection, etc) were used to calculate serial, bimonthly, provider-specific,

Figure: Risk Ratios (circle) and 95% confidence Intervals (line) between high initial antibiotic usage and subsequent high usage among hospitalists in four facilities in an academic healthcare system, Atlanta, Georgia. (Jan. 2020-Jun 2021)



observed-to-expected ratios (OERs). An OER of 1.25 indicates that the prescribing rate observed was 25% higher than predicted, adjusting for patient mix. We then used log binomial generalized estimating equations to assess whether a high prescribing rate (defined as an OER ≥ 1.25) for an individual provider in an earlier bimonthly period was associated with a persistent high rate for that provider in the following period. **Results:** Overall, 975 bimonthly periods were evaluated from 136 hospitalists. Most (58%) contributed data the entire 18-month study period. Median OERs were similar between hospitals: 0.94 (IQR, 0.65–1.28) for BS-HO antibiotic use, 0.99 (IQR, 0.73–1.24) for BS-CO antibiotic use, and 0.95 (IQR, 0.65–1.28) for anti-MRSA antibiotic use. At the individual prescriber level, roughly one-quarter of bimonthly OERs (range varied by group and hospital from 21% to 31%) were categorized as high. At 3 of the 4 hospitals, a provider with a high OER for either BS-HO or BS-CO antibiotic use in any bimonthly period was more likely to have a high OER in the subsequent period (Fig. 1). These observed risk ratios were statistically significant for BS-HO antibiotic use at only 2 hospitals: hospital A risk ratio (RR) was 1.54 (95% CI, 1.10–2.16); hospital B RR was 1.28 (95% CI, 0.90–1.82); hospital C RR was 0.76 (95% CI, 0.39–1.48); and hospital D RR was 1.71 (95% CI, 1.09–2.68). **Conclusions:** Our findings suggest that hospitalists with a higher than expected 2-month period of antibiotic prescribing are likely to continue to have elevated prescribing rates in the following period, particularly for BS-HO antibiotics. These findings increase the credibility of using a 2-month prescribing metric for BS-HO antibiotic stewardship efforts; further work is needed to evaluate utility for other antibiotic groupings.

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Presentation Type:

Poster Presentation - Top Poster Award

Subject Category: Antibiotic Stewardship

Outpatient antibiotic prescribing during the COVID-19 pandemic—United States, January 2019–October 2021

Destani Bizune; Sharon Tsay; Sarah Kabbani and Lauri Hicks

Background: Improving antibiotic use is a key strategy to combat antimicrobial resistance. Here, we have described national outpatient antibiotic prescribing trends during the COVID-19 pandemic. We compared the monthly numbers of prescriptions in 2020–2021 to those from 2019 to describe the impact of the pandemic and to highlight areas for improvement. **Methods:** We used the IQVIA National Prescription Audit

Figure 1. Volume of antibiotic prescriptions dispensed from retail pharmacies in the United States by age group and drug class, January 2019 – October 2021

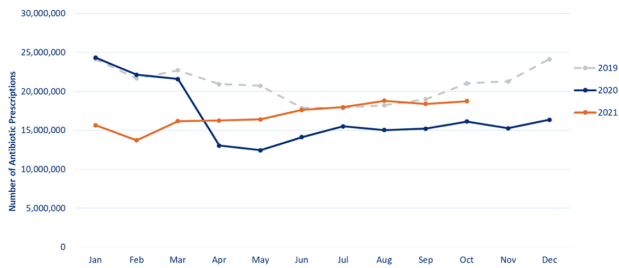
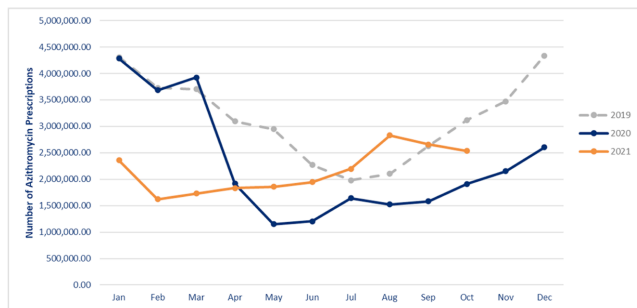


Figure 2. Volume of azithromycin prescriptions dispensed from retail pharmacies in the United States by age group, January 2019 – October 2021



(NPA) data set to identify all antibiotic prescriptions dispensed from US retail pharmacies during January 2019–October 2021. We calculated the percentage change in volume of prescriptions for each month during the pandemic (beginning in March 2020) compared to the baseline (defined as the corresponding month in 2019). Data were characterized by patient age group (0–19 years, 20–64 years, ≥65 years) and antibiotic class and drug, including azithromycin. **Results:** Antibiotic prescriptions were lower than baseline during March 2020–June 2021. The greatest decrease in antibiotic prescribing volume occurred in May 2020 (40.0% lower than May 2019) (Fig. 1), with the greatest decreases among children 0–19 years of age. However, prescribing was similar to baseline levels in July–August 2021 (Fig. 1). Specifically, azithromycin prescribing exceeded the 2019 baseline by 11.0% in July and further to a 34.5% increase in August 2021 (Fig. 2). Increases in azithromycin prescribing in August 2021 were observed across all age groups: 20–64 years (46.9% above baseline), ≥65 years (25.3% above baseline), and children 0–19 years (7.8% above baseline). **Conclusions:** Antibiotic prescribing volume was lower during 2020 and the first half of 2021 compared to the corresponding months in 2019. Decreases in outpatient antibiotic prescriptions during the pandemic likely reflect decreased utilization of outpatient healthcare and decreased transmission of non-COVID-19 infections secondary to non-pharmaceutical interventions (eg, masking, social distancing, school closures). However, outpatient antibiotic prescribing levels in general, and azithromycin prescribing in particular, approached or exceeded pre-pandemic levels in July and August 2021. Ongoing surveillance and sustained outpatient antibiotic stewardship efforts are needed to optimize antibiotic use during the COVID-19 pandemic and beyond.

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Presentation Type:

Poster Presentation - Top Poster Award

Subject Category: Antibiotic Stewardship

The effect of a parenteral-to-oral conversion program for high-bioavailability antibiotics use

Wooyoung Jang and Bongyoung Kim

Background: Appropriate conversion of antibiotics from parenteral to the oral route can lower the risk of catheter-associated infections, reduce medical costs, and shorten hospitalization. We investigated the effect of a parenteral-to-oral conversion program on high-bioavailability antibiotics conducted by medical students and the changes in perceptions of oral antibiotics after participating in the program. **Methods:** The parenteral-to-oral conversion program was implemented as a core clinical practice course for the fifth-year medical students in 2021 at the infectious diseases department in an affiliated hospital of a medical school in Korea. Half of the students in this class participated in the program from January to October 2021. An evaluation of the possibility of oral conversion was performed for parenterally administered, high oral-bioavailability antibiotics including ciprofloxacin, levofloxacin, moxifloxacin, metronidazole, linezolid, and trimethoprim-sulfamethoxazole. These agents are prescribed in the departments of pulmonology, gastroenterology, general surgery, and neurology. The medical students reviewed medical records for the patients treated with those antibiotics and wrote a recommendation for oral conversion for the cases with “possible oral conversion” after an infectious disease specialist confirmed their assessments. The cases without administration of any oral drugs or with the duration of parenteral antibiotic use of <3 days were excluded from the evaluation. The following cases were considered as “impossible oral conversion” and were excluded from the intervention: (1) admitted to the ICUs, (2) admitted to the protected isolation rooms, (3) difficult to take oral medication, (4) risk of insufficient medication absorption, (5) bone and joint infections, (6) fever within 24 hours, (7) insufficient response to antibiotic therapy, and (8) recommended to use intravenous antibiotics by consultation with an infectious disease specialist. Furthermore, a survey was conducted on the perception of oral antibiotics in medical students before and after clinical practice to evaluate the educational effect of this program. **Results:** In total, 923 cases were reviewed, and 190 (20.6%) of 923 antibiotics prescriptions with high oral bioavailability were found to be administered parenterally even though they could be converted oral administration. Among these 190 antibiotics prescriptions, 46 (24.2%) were changed via a written proposal within 48 hours, 83 (43.7%) proposed changes were declined, and 61 (32.1%) antibiotics prescriptions were discontinued within 48 hours.

Table 1. Possible oral conversion among parenteral-administering antibiotics with high-bioavailability

	Pulmonology (n=487)	Gastroenterology (n=283)	General Surgery (n=79)	Neurology (n=74)	Total (n=923)
Possible oral conversion	121 (24.8)	60 (21.2)	5 (6.3)	4 (5.4)	190 (20.6)
Impossible oral conversion	366 (75.2)	223 (78.8)	74 (93.7)	70 (94.6)	733 (79.4)
History of adverse effects of antibiotics	4 (0.8)	1 (0.4)	1 (1.3)	4 (5.4)	10 (1.1)
Admitted to the intensive care units	108 (22.2)	7 (2.5)	6 (7.6)	13 (17.6)	134 (14.5)
Admitted to the protected isolation rooms	20 (4.1)	7 (2.5)	1 (1.3)	0 (0)	28 (3.0)
Difficult to take oral medication due to tube feeding	150 (30.8)	11 (3.9)	4 (5.1)	20 (27.0)	185 (20.0)
Difficult to take oral medication due to fasting	61 (12.5)	83 (29.3)	19 (24.1)	22 (29.7)	185 (20.0)
Risk of insufficient medication absorption due to the history of gastrointestinal surgeries	37 (7.6)	43 (15.2)	49 (62.0)	14 (18.9)	143 (15.5)
Bone and joint infections with parenteral antibiotics within 28 days	2 (0.4)	1 (0.4)	1 (1.3)	4 (5.4)	8 (0.9)
Fever within 24 hours	101 (20.7)	65 (23.0)	30 (38.0)	22 (29.7)	218 (23.6)
Insufficient response to antibiotic therapy for more than 3 days such as CRP or procalcitonin elevation	202 (41.5)	99 (35.0)	47 (59.5)	31 (41.9)	379 (41.1)
Recommended to use intravenous antibiotics by infectious disease consultation	54 (11.1)	13 (4.6)	14 (17.7)	36 (48.6)	117 (12.7)
Response to the recommendation of the conversion of parenteral to per oral antibiotics ¹					
Accept within 48 hours	27 (22.3)	19 (31.7)	0 (0)	0 (0)	46 (24.2)
Decline	59 (48.8)	20 (33.3)	2 (40.0)	2 (50.0)	83 (43.7)
Discontinuation within 48 hours	35 (28.9)	21 (35.0)	3 (60.0)	2 (50.0)	61 (32.1)

Data are presented as number (%).

These are investigated in case of one of Metronidazole, Ciprofloxacin, Levofloxacin, Moxifloxacin, Trimethoprim/sulfamethoxazole, and Linezolid were administered intravenously or intramuscularly for more than 3 days, and oral medications are being administered besides parenteral antibiotics.

Abbreviations: CRP, c-reactive protein

¹ These values are the ratio among the cases which are possible oral conversion.