

Presentation Type:

Poster Presentation - Oral Presentation

Subject Category: Antibiotic Stewardship

Situations Predisposing Primary Care Patients to Use Antibiotics Without a Prescription in the United States

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Background: Using antibiotics without medical guidance (non-prescription use) is a potential safety threat to individual and public health. Patients' situations can impact their intentions to use non-prescription antibiotics in the future (intended use). This survey (1) explores the dimensionality of 13 predefined situations to identify 'summary factors,' which include conceptually similar situations that influence patients' intended use of non-prescription antibiotics, and (2) identifies the socio-demographic predictors associated with these summary factors. **Methods:** A cross-sectional survey was conducted from January 2020–June 2021 in the waiting rooms of six safety-net primary care clinics and two private emergency departments. We used principal component analysis as a data reduction technique and confirmed the factor structure of the situations (identifying three situational summary factors). Multivariate linear regression identified the sociodemographic predictors (e.g., age, gender, race, education, insurance, healthcare system, language preference, birth country, and health literacy) associated with each summary factor. **Results:** Of the 564 patients surveyed, the majority were female (72%), Hispanic or Latinx (47%), college-educated (44%), and received public health insurance (e.g., Medicaid or County Financial Assistance) (56%). The largest proportion of patients endorsed intended non-prescription antibiotic use for situations involving high doctor visit costs (29.8%), having leftover prescription antibiotics (50.4%), and experiencing symptom relief with prior use of antibiotics (47.5%) (Figure 1). We identified three situational summary factors: (1) perceived barriers to a doctor visit and receiving a prescription (Cronbach's alpha [α]=0.96), (2) convenience and accessibility of non-prescription antibiotics (α=0.81), and (3) previous symptom relief with antibiotics (α=0.95). After controlling for gender, race, education, insurance, language preference, birth country, and health literacy, our multivariate regression results revealed that younger patients ($P < 0.04$) and patients attending the safety-net health system ($P < 0.001$) had more intended use of non-prescription antibiotics for all three summary factors (Figure 2). **Conclusions:** Our study revealed that younger patients and individuals receiving care from the safety-net clinics had an increased risk of intended non-prescription antibiotic use across all summary factors. Future stewardship interventions should consider the types of situations that drive patients' decisions to use antibiotics without a prescription. Interventions aimed at reducing barriers to healthcare (e.g., high costs and long waits associated with doctor appointments) and educating individuals on the risks associated with inappropriate antibiotic use while providing alternative (non-antibiotic) treatment options may reduce antibiotic use and antimicrobial resistance.

Figure 2. Multivariable linear regression results for each situational summary factor

	Intended use of non-prescription antibiotics by situational summary factor:					
	Summary factor 1: Barriers to a doctor visit and prescribed medicines		Summary factor 2: Convenience and accessibility of non-prescribed antibiotics		Summary factor 3: Previous symptom relief with antibiotics	
Sociodemographic Factors*	β (Std. Error)	P value	β (Std. Error)	P value	β (Std. Error)	P value
Age	-0.02 (0.01)	P=0.03	-0.02 (0.01)	P=0.004	-0.01 (0.003)	P<0.004
Healthcare System						
Public Safety-Net Clinics (vs. Private EDs)	1.34 (0.24)	P<0.001	0.83 (0.16)	P<0.001	0.46 (0.10)	P<0.001

*All models were adjusted for age, sex, race/ethnicity, education, insurance, healthcare system, birth country, survey language, and health literacy. Patient sex, race/ethnicity, education, insurance, survey language, and health literacy were not significant in any of the models.

†Columbia, 1 Costa Rica, 6 Cuba, 1 Dominican Republic, 14 El Salvador, 6 Guatemala, 15 Honduras, 131 Mexico, 2 Nicaragua, 1 Panama, 1 Peru, 3 Venezuela (countries are listed in alphabetical order)

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Antibiotic Prescribing by General Dentists in the Outpatient Setting — United States, 2018–2022

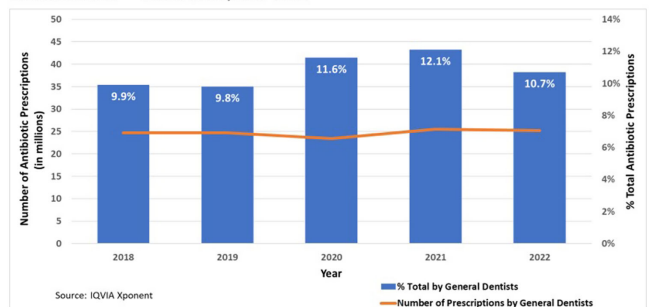
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Background: Inappropriate antibiotic use impacts patient safety and antimicrobial resistance patterns. In 2013, general dentists in the U.S. prescribed nearly 10% of all outpatient oral antibiotics (24.5 million prescriptions). The American Dental Association (ADA) published guidelines in 2019 recommending limited antibiotic prescribing for the treatment of dental pain and swelling. We characterized dental prescribing during 2018–2022 to assess whether antibiotic use decreased after the guideline's release. In addition, we examined access to dental care. **Methods:** All antibiotic prescriptions dispensed during 2018–2022 were extracted from the IQVIA Xponent database, which captured ≥92% of all U.S. outpatient prescriptions and projected to 100% coverage. Prescriptions by general dentists were compared to total outpatient oral antibiotic prescriptions and summarized by patient sex, patient age, and prescriber geographic region. Census denominators were used to calculate prescribing rates per 1,000 persons. IQVIA general dentist counts were used to calculate dentists per 100,000 persons. **Results:** General dentists prescribed 24.7 million antibiotic prescriptions in 2018 (75 prescriptions per 1,000 persons) compared with 25.2 million (76 prescriptions per

Figure 1. Patient-reported intended use for each situation by the healthcare system. Differences between healthcare systems (P-value<0.05) are significant

Patient Characteristics	Overall (N=564) n (%)	Safety-net clinics (N=489) n (%)	Private EDs (N=155) n (%)	Difference between safety-net and EDs (P-value)
<i>If you were feeling sick, would you take antibiotics in the following situations without consulting a doctor/nurse/dentist/clinic? (Agree)</i>				
Summary factor 1:				
Barriers to a doctor visit and prescribed medicines				
You cannot take time off work.	146 (25.9)	126 (30.8)	20 (12.9)	<.001*
You have no time to go to the doctor because of family responsibilities.	149 (26.4)	126 (30.8)	23 (14.8)	<.001*
You cannot get to the doctor's office because of transportation problems.	144 (25.5)	128 (31.3)	16 (10.3)	<.001*
The doctor's office hours are not convenient for you.	150 (26.6)	135 (33)	15 (9.7)	<.001*
The doctor has no time to see you when you are sick.	154 (27.3)	138 (33.7)	16 (10.3)	<.001*
A visit with a doctor is too expensive.	168 (29.8)	137 (33.5)	31 (20)	0.002*
Summary factor 2:				
Convenience and accessibility of non-prescribed antibiotics				
You have leftover antibiotics at home from a previous prescription.	284 (50.4)	227 (55.5)	57 (36.8)	<.001*
Friends/relatives give you antibiotics.	126 (22.3)	105 (24.9)	20 (12.9)	0.001*
You can buy antibiotics without a prescription in the United States.	108 (19.1)	88 (21.5)	20 (12.9)	0.029*
You can buy antibiotics without a prescription in another country.	101 (17.9)	79 (19.3)	22 (14.2)	0.203
Antibiotics are cheaper than over-the-counter cold and flu medications.	93 (16.5)	78 (19.1)	15 (9.7)	0.009*
Summary factor 3:				
Previous symptom relief with antibiotics				
You not better by taking this antibiotic before.	268 (47.5)	210 (51.3)	58 (37.4)	0.004*
Your doctor prescribed you this antibiotic for the same symptoms before.	280 (49.6)	220 (53.8)	60 (38.7)	0.003*

Figure 1: Outpatient Antibiotic Prescriptions and Percent of Total Antibiotics Prescribed by General Dentists — United States, 2018–2022



1,000 persons) in 2022. During 2020–2022, general dentists prescribed >10% of all outpatient antibiotic prescriptions (range 10.7%–12.1%). In each year, prescription rates were higher for females, patients > 65 years, and among prescribers in the Northeast. In 2022, there were 58 general dentists per 100,000 persons in the United States. The highest general dentist rate was in District of Columbia (100 per 100,000 persons) and the lowest rate was in Delaware (41 per 100,000 persons). **Conclusions:** Despite the ADA's 2019 guidelines, prescribing by general dentists remained stable during 2018–2022. Because the total number of antibiotic prescriptions overall decreased, general dentists' share of all outpatient antibiotic prescriptions increased to >10% in recent years. Rate variation by patient characteristics and prescriber region may reflect differences in dental disease burden or may represent unnecessary antibiotic use. Dental antibiotic stewardship is needed, including dissemination and implementation of current prescribing guidelines. Further evaluation of prescribing indications and access to dental care is needed to inform dental stewardship priorities.

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Intervention Targets to Optimize Antibiotic Prescribing on Discharge from the Hospital to Nursing Homes

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Background: Approximately half of antibiotics used in nursing home (NHs) are initiated in acute care hospitals prior to NH admission. Optimizing antibiotic prescribing on hospital discharge to these facilities presents an opportunity to improve NH antibiotic use. We aimed to identify intervention targets to optimize antibiotic use on discharge from the hospital to NHs. **Methods:** This was a multicenter, cross-sectional study across 9 acute care hospitals in Oregon, Wisconsin, and Washington. We selected a 20% random sample of adult (age >18) inpatients prescribed at least one antibiotic on discharge from the hospital to a NH between 2016–2018. We excluded patients discharged from the emergency department or an intensive care unit. Study data were electronically extracted from patients' electronic health records and supplemented with manual chart review. Antibiotic optimization opportunities were determined by an infectious diseases (ID) physician or ID pharmacist and classified as definitely, possibly, or unlikely. Expert reviewers also recorded the type of optimization opportunity and the rationale for each determination. A gamma lasso algorithm was used to identify patient-level characteristics associated with definite optimization opportunity, which were then included in a logistic regression model. **Results:** There were 2761 antibiotic prescriptions among 2215 patients. Mean (standard deviation) age was 71.9 (14.3) years and 48.8% were male. Most discharges (83.1%) were prescribed one antibiotic, 15.2% were prescribed two antibiotics, and 1.8% were prescribed three antibiotics. The most frequently prescribed antibiotics were cephalexin (10.4%), vancomycin (9.8%), and amoxicillin clavulanate (8.4%). Among the 2761 antibiotic prescriptions, expert reviewers

determined that 18.4% could definitely be optimized, 36.0% could possibly be optimized, and 45.3% unlikely could have been optimized. Among the 508 definite antibiotic optimization opportunities, 25.2% were to subtract the antibiotic, 56.3% were to change the antibiotic, 11.0% were to change the dose, 25.0% were to change the duration, 0.8% were to change the route, and 1.8% were to change the schedule. Patient-level characteristics found to be associated with definite antibiotic optimization opportunity included age over 80 years (odds ratio (OR)=1.44, 95% confidence interval (CI): [1.14, 1.82]), length of stay < 8 days (OR=1.40, 95% CI: [1.09, 1.81]), discharge with multiple antibiotic prescriptions (OR=1.92, 95% CI: [1.39, 2.63]), and discharge with prescription for oral vs intravenous (IV) antibiotics (OR=2.08, 95% CI: [1.49, 2.95]). **Conclusion:** We identified several patient and antibiotic characteristics which may serve as intervention targets to optimize antibiotic prescribing on discharge from the hospital to nursing homes.

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An Examination of Racial/Ethnic Differences in the Antibiotic Treatment of Community Acquired Pneumonia

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Background: Community Acquired Pneumonia (CAP) is the most common reason for antibiotic treatment in hospitalized adults. Some prior studies have found treatment differences by race/ethnicity but research on the topic is limited, results are mixed, and it is unclear if clinical outcomes are affected. We sought to examine whether guideline-concordant CAP care and patient outcomes varied by race/ethnicity. **Methods:** Using the Vizient clinical database, we conducted a cross sectional analysis of all hospitalized patients > = 18 years of age with a primary diagnosis of pneumonia (ICD10 codes: J12-J18) from 2018–2021. Univariate and bivariate analyses examined the distribution of demographic, clinical and hospital characteristics across race/ethnicity. The primary outcome was receipt of therapy concordant with ATS/IDSA Clinical Practice Guideline for CAP. Final models included only patients with bacterial pneumonia and examined the relationship between race/ethnicity and guideline-concordant antibiotic treatment. Secondary analysis examined the interaction between race/ethnicity and concordant antibiotic treatment with length of stay >7 days, 30-day hospital readmission, adverse events or complications in separate models. We used hierarchical multivariable regression models accounting for clustering within patients and among patients hospitalized at the same facility. Due to sample size, significance was assessed with an OR > = 1.2 and p ≤ 0.05. All analyses used SAS (v.9.4, SAS Institute Inc. Cary, NC). **Results:** There were 1,277,770 admissions with a primary diagnosis of bacterial CAP. Sixty-nine percent of the sample was White, 18% Black, 8% Hispanic, 2% Asian and 3% identified as other. 56% of the sample received concordant care. In adjusted models Black patients had greater odds of overall concordant care (OR 1.22; p 7 days (OR 0.67 p <.0001), complication or adverse event (OR 0.75 p <.0001), but not readmission within 30 days. **Conclusion:** We observed differences between Black and White patients in the receipt of concordant treatment. Hospital bed size, CMI and region played an important role in both antibiotic treatment decisions and clinical outcomes, indicating that hospital and regional prescribing cultures may play a role in treatment inequities.

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