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Prescribing Antibiotics in the US

Antibiotics are powerful agents for fighting illness and disease. However, they have been used so widely and for so long that infectious organisms have adapted to them, making the drugs less effective. Antibiotic-resistant infections can happen anywhere; however, most occur in the general community. Yet most deaths occur in healthcare settings, such as hospitals and long-term care homes.

Each year in the United States at least two million people become infected with antibiotic-resistant bacteria and approximately 23,000 people die. Many more die from other conditions that were complicated by an antibiotic-resistant infection.

Bacteria seem to find ways of resisting therapeutic antibiotics. Therefore, aggressive action is needed now to keep new resistance from developing and to prevent existing resistance from spreading.

Antibiotic use can lead to other adverse outcomes, such as allergies or *Clostridium difficile* infections. *C. difficile* was estimated to cause almost half a million infections in the United States in 2011, with 29,000 dying within 30 days of their initial diagnosis. High-risk individuals include older adults who take antibiotics, but did not have an overnight healthcare facility stay. However, 41% had a physician or dentist visit within the past three months.

Dentists use antibiotics to manage bacterial oral infections, prevent infective endocarditis and protect certain immunocompromised patients. Dentists prescribe approximately 10% of outpatient antibiotics in the United States. However, there is a paucity of information concerning dentist antibiotic prescribing patterns, especially considering changing prophylaxis

recommendations.

A recent *Journal of the American Dental Association* article described prescribing patterns of practising general dentists by antibiotic agent and category, patient demographic characteristics and geographic region, based on 2013 data.¹ Information came from the Xponent (QuintilesIMS) database, which records more than 75% of all outpatient prescriptions and payers.

General dentists prescribed 24.5 million courses of outpatient antibiotics in 2013 (rate = 77.5 prescriptions per 1000 people). Dentists prescribed more antibiotics for female patients (56.1%). Less than 10% of prescriptions were for children under 19 years. Most adult prescriptions were for those aged 40–64 (44.8%) and 65 and over (23.4%). The North-East region census had the highest prescribing rate (87.0/1000), while the South region census had the greatest number (8.96 million).

Penicillins were clearly the most common antibiotic category (17 million prescriptions, 69.6% of all antibiotics). Next were lincosamides (3.6 million, 14.6%) and macrolides (1.3 million, 5.4%). Dentists also prescribed antibiotic categories generally not indicated in dentistry. These included quinolones and urinary anti-infective agents.

The most prescribed antibiotic agent was amoxicillin (13.8 million, 56.3% of all antibiotics). Other commonly prescribed agents included clindamycin (3.6 million, 14.4%), penicillin V (3.2 million, 11.2%), cephalexin (1.2 million, 4.9%) and azithromycin (1.1 million, 4.7%). Other popular antibiotics include amoxicillin clavulanate, doxycycline, ciprofloxacin, erythromycin and trimethoprim-sulfamethoxazole.

The authors indicate that their work was the first large scale study of outpatient antibiotic prescribing patterns of general dentists in the United States. They felt that the results could help demonstrate how antibiotics are used in dentistry.

Most antibiotic prescriptions were

written for women. This was expected because previous studies report that women generally use healthcare services more often than men. This was true for women aged 20–64 years concerning visits to the dentist.

There was marked prescription variability based on geographic location. High prescribing states had double the rates of low prescribing states. This suggested that prescribing behaviours differed across the country; however, the cause(s) of the variations was unclear. One possibility is that lower prescribing rates reflect decreased access to medical and dental care (ie less preventive dental care). Also, do the differences reflect variability in the quality of antibiotic prescribing patterns? Factors that affect prescribing variability and appropriateness need to be better described to identify interventions to improve performance.

Although study information came from the United States, findings should be of interest to dentists worldwide. Prescribing dentists have a key role to play in improving how antibiotics are used. This includes how and why specific antibiotics are prescribed and how factors, such as location and specialty, influence decision processes. Additional studies concerning antibiotic prescribing in dentistry are needed. This is especially valid with regard to current prophylaxis guidelines. Revised guidelines based on current information exist and there are outline treatment options for common dental infections. They include first- and second-line treatment recommendations for varying clinical specialties. Such information must be timely and clinically relevant. Sometimes, the best course of action may be not to prescribe an antibiotic.

Reference

1. Roberts RM, Bartoces M, Thompson SE, Hicks LA. Antibiotic prescribing by general dentists in the United States, 2013. *J Am Dent Assoc* 2017; **148**: 172–178.

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