



Charles John Palenik

# Inappropriate Antibiotic Prescribing by US General Dentists

The Centers for Disease Control and Prevention indicate that more than 262 million prescriptions for antibiotics are written annually in US outpatient facilities.<sup>1</sup> However, estimates indicate that between 30% and 50% of antibiotic prescriptions may be unnecessary.<sup>1,2</sup> Although essential in the treatment of certain infections, antibiotic misuse and overuse have led to the development of resistant forms, which account for 23,000 deaths and billions of dollars in excess spending annually.<sup>3</sup>

About 10% of antibiotics in the United States are prescribed by dentists.<sup>1</sup> However, the rate of antibiotic prescribing by US dentists appears to be declining.<sup>4</sup> Unfortunately, there is limited information concerning prescribing practices of dentists.

A recent study investigated longitudinal antibiotic prescribing patterns among a large cohort of patients treated by dentists. It quantified the number of potentially inappropriate prescriptions and estimated the costs associated with antibiotic misuse.<sup>4</sup>

The authors used data from the Express Scripts Holding Company, which is the largest independent prescription benefits manager (over 80 million clients) in the United States. The study period was 2013–2015 and involved all 50 states and the District of Columbia. Data included practitioner specialty, antibiotic name, dose and length

of treatment. Also obtained was information concerning costs (both insurance and patient payments) and the number of beneficiaries in the database. Excluded were topical antibiotics and antifungal, antiparasitic and antiviral agents. Antibacterial agents were included.

The study analysed antibiotics prescribed by general dentists for people 18 years and older. Prescriptions were divided into three categories, based on duration (days' supply). The categories were prophylaxis (1 day or less), indeterminant (2–4 days) and treatment (5 or more days). Prophylaxis and treatment prescriptions were deemed appropriate while indeterminant prescriptions were considered inappropriate. The designations were based on American Dental Association (ADA) publications and author consensus.<sup>5</sup> Antibiotics without common clear dental indications were listed as inappropriate. Erythromycin was always considered as inappropriate. Some antibiotics not listed by the ADA were considered as being appropriate.

The authors determined the number of prescriptions and total drug costs by intended purpose and appropriateness category. Also calculated were the number of prescriptions and drug costs per 1000 beneficiaries in each category.

About 6.2 million antibiotic prescriptions were identified during the 3 study years. The number of prescriptions remained stable; however, costs declined from \$19 million (\$614 per 1000 beneficiaries) in 2013 to \$15 million (\$512 per 1000 beneficiaries) in 2015.

More than 12% of prescriptions and 6% of costs in the intermediate category

were considered inappropriate. The duration of antibiotic use was too long for prophylaxis and too short to treat most dental infections properly. This represented more than \$3 million in inappropriate costs.

Also measured were prescriptions that should not be used routinely in general dentistry. This involved approximately 100,000 (of 6,228,948, 1.63%) prescriptions. These accounted for \$5 million (10.36% of total) in costs over the 3-year study period. Although the number of inappropriate prescriptions declined, associated costs rose 24.71%.

When considering both treatment duration and agent prescribed, more than 850,000 (13.7%) were considered as being inappropriate. This represents more than \$8 million in unnecessary health expenditures. The amount increased from \$2.6 million in 2013 to \$2.8 million in 2015.

The authors indicated that their study was the first to quantify the number of inappropriately prescribed antibiotics by general dentists in the United States and to estimate associated costs. While the rate of antibiotic prescribing remained stable during the study period, there was a slight decrease in antibiotics used for prophylaxis and indeterminant regimens. 2014 ADA guidelines recommended that antibiotic prophylaxis should not be used before procedures for patients with prosthetic joints.<sup>6</sup> Antibiotic spending decreased over time, but this was most likely due to cost containment efforts.

The study results contrast with those from Canada, the Czech Republic and Australia. Dentists reported a variety of reasons for prescribing antibiotics. A study in the UK found patients who requested antibiotics and refused surgery and the

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desire of dentists to save time led to more antibiotic prescriptions.<sup>7</sup> Another study in the UK found that the tendencies of dentists to prescribe antibiotics could not be predicted by gender, postgraduate qualifications status or years in practice.<sup>8</sup> The results suggested that antibiotic overprescribing is likely to be a widespread problem.

Inappropriate antibiotic use based on antibiotic type and treatment duration was common (almost 14%), which resulted in the mispending of millions of healthcare dollars. The authors suggested that qualitative studies of the rationales used by dentists for antibiotic selection and prescription duration are needed to evaluate appropriateness better.

It appears that antibiotic stewardship programs are needed. A 2001 study of 175 dentists in the UK reported a 32.5% decrease in antibiotic prescribing after an educational intervention in which guidelines were issued.<sup>9</sup>

## References

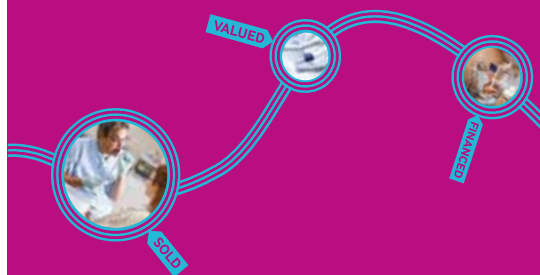
- Hicks LA, Bartoces MG, Roberts RM, Suda KJ, Hunkler RJ, Taylor TH Jr, Schrag SJ. US outpatient antibiotic prescribing variation according to geography, patient population, and provider specialty in 2011. *Clin Infect Dis* 2015; **60**: 1308–1316.
- Fleming-Dutra KE, Hersh AL, Shapiro DJ, Bartoces M, Enns EA, File TM Jr *et al*. Prevalence of inappropriate antibiotic prescriptions among US ambulatory care visits, 2010–2011. *J Am Med Assoc* 2016; **315**(17): 1864–1873.
- Antibiotic resistance threats in the United States, 2013. Available at: <http://www.cdc.gov/drugresistance/pdf/ar-threats-2013-508.pdf>. Accessed May 26, 2018.
- Durkin MJ, Feng Q, Warren K, Lockhart PB, Thornhill MH, Munshi KD *et al*. Assessment of inappropriate antibiotic prescribing among a large cohort of general dentists in the United States. *J Am Dent Assoc* 2018; **149**: 372–381.
- American Dental Association. Oral Health Topics, Antibiotic Stewardship. Available at: [http://www.ada.org/en/member-center/oral-health-topics/antibiotic-steward-](http://www.ada.org/en/member-center/oral-health-topics/antibiotic-stewardship)
- Ship. Accessed May 26, 2018.
- Sollecito TP, Abt E, Lockhart PB, Truelove E, Paumier TM, Tracy SL *et al*. The use of prophylactic antibiotics prior to dental procedures in patients with prosthetic joints: evidence-based clinical practice guideline for dental practitioners – a report of the American Dental Association Council on Scientific Affairs. *J Am Dent Assoc* 2015; **146**: 11–16.
- Cope AL, Francis NA, Wood F, Chestnutt IG. Antibiotic prescribing in UK general dental practice: a cross-sectional study. *Community Dent Oral Epidemiol* 2016; **44**: 145–153.
- Seager JM, Howell-Jones RS, Dunstan FD, Lewis MA, Richmond S, Thomas DW. A randomised controlled trial of clinical outreach education to rationalise antibiotic prescribing for acute dental pain in the primary care setting. *Br Dent J* 2006; **201**: 217–222.
- Palmer NA, Dailey YM, Martin MV. Can audit improve antibiotic prescribing in general dental practice? *Br Dent J* 2001; **191**: 253–255.

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