

Antibiotic Overprescription: Policy Considerations For Academic Dentistry

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POLICY BRIEF

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EXECUTIVE SUMMARY

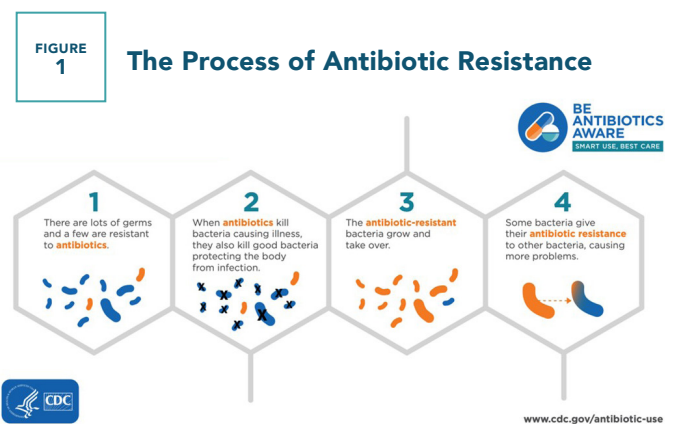
Overprescription of antibiotics is a rapidly increasing public health concern. Dental educators play a pivotal role in promoting antibiotic stewardship to monitor overprescription and limit antibiotic resistance. Introducing prescription guideline policies in dental school curricula and clinics can arm dental educators

with the tools to teach safe and effective antibiotic prescription guidelines to the oral health care workforce of tomorrow. This policy brief underscores pedagogical initiatives that academic dentistry can take to combat antibiotic overprescription and be a steward in the fight against antibiotic resistance.

CONTEXT OF THE PROBLEM

Antibiotic resistance is a major public health challenge, primarily due to the rise in antibiotic overprescription. Antibiotic resistance happens when pathogens, such as bacteria and certain fungi, develop the mechanisms to fight and become resistant to the antimicrobial effects of certain medications (Figure 1).¹ In addition, the lack of innovation in developing new antibiotics undermines public health efforts to combat emerging and threatening bacterial infections.² According to the Centers for Disease Control and Prevention (CDC), more than 2.8 million new antibiotic-resistant infections occur yearly, resulting in more than 35,000 deaths.¹

It is estimated that approximately 10% of antibiotic prescriptions are written by dentists³ as a result of treating oral health concerns, such as dental caries and periodontal diseases, which may contribute to the increase in antibiotic resistance.⁴ In addition to writing prescriptions to treat infection, dentists also use antibiotics for prophylaxis, the practice of prescribing antibiotics before dental procedures to protect patients at risk of developing infections.



Source: Centers for Disease Control and Prevention. How Antibiotic Resistance Happens. At: <https://www.cdc.gov/antibiotic-use/graphics.html>. Accessed March 29, 2021.

Research indicates that 80% of prescriptions written for antibiotic prophylaxis between 2011 and 2015 were unnecessary (Figure 2).⁵ If antibiotic resistance continues to increase, antibiotic prophylaxis will become less effective, making dental and oral health procedures more complex.

Several consequences are associated with antibiotic resistance. International and domestic public health

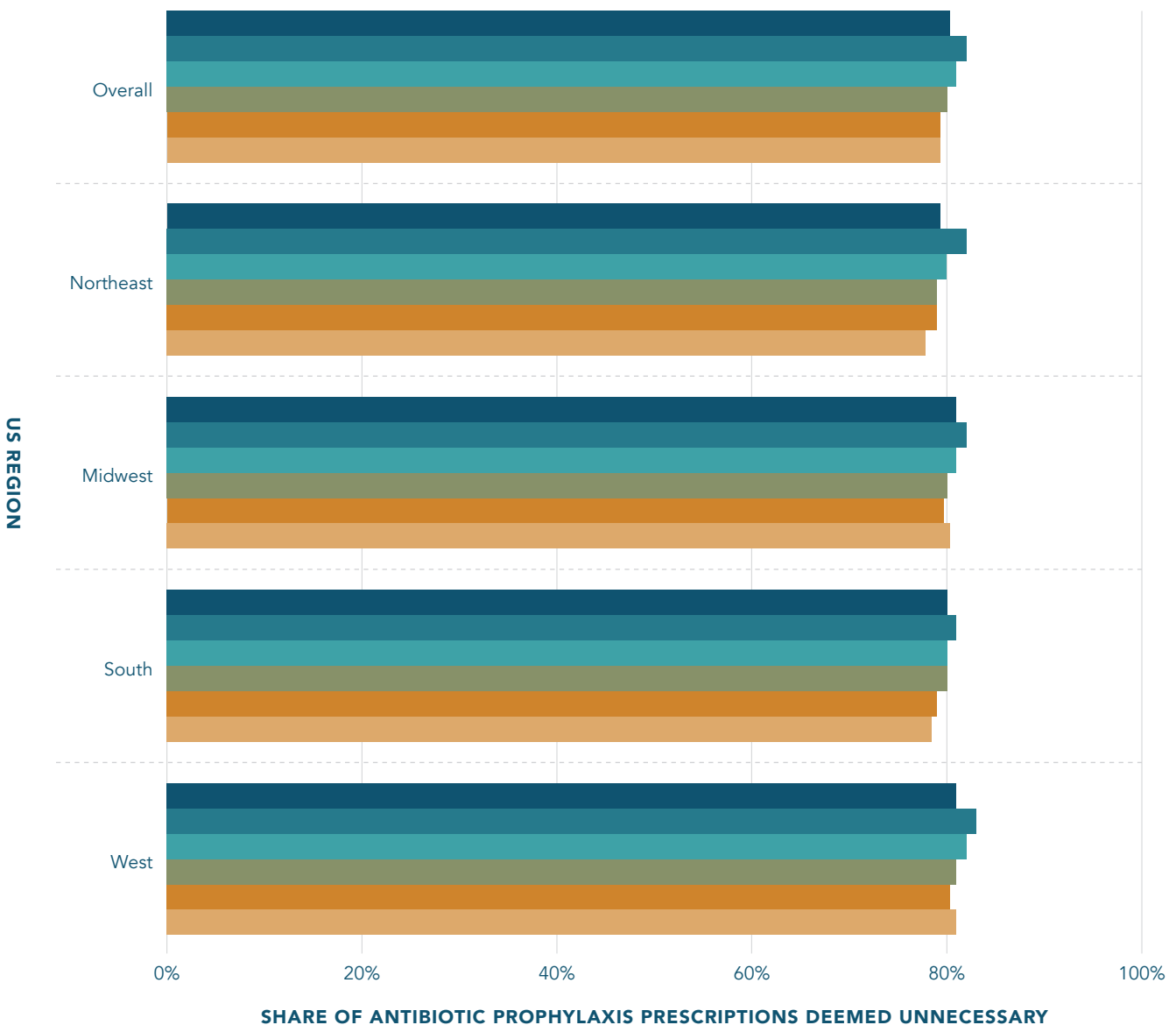
agencies, such as the World Health Organization and the U.S. Food and Drug Administration, explain that increased medical costs and higher mortality rates due to complex bacterial infections are key implications of antibiotic resistance.^{6,7} The overuse of antibiotics can result in infections that are more difficult to treat, necessitating stronger medications

over longer periods of time. Therefore, it is important for dental schools to adopt antibiotic prescription guidelines and incorporate them into the curriculum, while also promoting continuing education for practicing dentists to have a deeper understanding of these guidelines.

FIGURE 2 Unnecessary Dental Antibiotic Prophylaxis in the United States by Region, Between 2011 and 2015

Source: Suda KJ, Calip GS, Zhou J, et al. Assessment of the appropriateness of antibiotic prescriptions for infection prophylaxis before dental procedures, 2011 to 2015. JAMA Netw Open 2019;2(5):e193909. DOI: 10.1001/jamanetworkopen.2019.3909.

■ Total ■ 2011 ■ 2012 ■ 2013 ■ 2014 ■ 2015



CURRENT SETTING AND RATIONALE FOR CHANGE

To mitigate this growing public health problem, dental educators should consider incorporating appropriate antibiotic prescription practices into dental school curricula and school-based clinics. In one study, more than 70% of dental students stated they could benefit from more education and training on the appropriate prescription of antibiotics.⁸ According to the study, most of the students reported they were “not at all familiar” with the term “antimicrobial stewardship,” and about 30% were unsure if their school had guidelines for antibiotic prescription.⁸ However, both students and faculty agreed academic dentistry should be involved in reducing antibiotic resistance.⁸

Furthermore, a study evaluating practicing dentists’ and dental students’ knowledge of and compliance with guidelines for prescribing antibiotic prophylaxis concluded that the knowledge of guidelines ranged from less than 2% to as high as 100%, and compliance ranged between 40–80%.⁹ Although this study is not generalizable across dental education, the wide variation in knowledge about antibiotic prescription guidelines and compliance illustrate the importance of instituting procedures and protocols in didactic and clinical curricula on the consequential effects of antibiotics overprescription and resistance. Dental education should also promote the use of antibiotic prescription guidelines, such as the [CDC’s Checklist for Antibiotic Prescribing in Dentistry](#).

Some dental schools have taken measures to address the overprescription of antibiotics. In 2016, the University of Illinois at Chicago College of Dentistry (UIC COD) began participating in the [Antibiotic Stewardship Program \(ASP\)](#).¹⁰ This program created a decision-making tool for dental students and practitioners to determine when

antibiotic use is appropriate. Since joining the ASP, UIC COD has partnered with the UIC College of Pharmacy and the other seven health sciences colleges to reduce the use of antibiotics within their school-based clinic. These efforts reduced urgent care dental antibiotic prescription by more than 70% at UIC COD, where students provide care to more than 30,000 patients annually, including general and urgent dental care.³

Interprofessional collaboration between health care disciplines also can help reduce antibiotic overprescription. The ASP at UIC is an example of the effectiveness of this type of collaboration. A team comprised of dentists, pharmacists and physicians came together to examine the ASP at UIC and determine its impact on improving antibiotic prescribing by dentists in Illinois. The health care team provided educational materials to patients and providers, created clinical guidelines and monitored the antibiotic prescribing rate at urgent care visits for oral infections at the College of Dentistry. The education given to providers included specific antibiotic prescribing data, checklists to improve prescribing habits and antibiotic prophylaxis resources. Patients were educated on the potential scenarios in which they may be prescribed antibiotics by their dentists and the possible long-term effects of those antibiotics. These efforts demonstrate that through collaboration, unnecessary antibiotic prescription for oral infection in urgent care and emergency room (ER) settings can be significantly decreased.³ Partnerships between dental schools and ERs can help increase access to dental care and reduce unnecessary antibiotic prescription through the use of standardized guidelines.

POLICY CONSIDERATIONS

There is a demonstrated need for improvement in dental professionals' antibiotic prescription habits. The use and implementation of antibiotic stewardship programs can help promote responsible use of antibiotics. The following policy considerations can help improve dental education and oral health care:

1. Include lessons on alternative infection prevention practices in the dental school curriculum to avoid the need of antibiotics.
2. Ensure dental students have a deep understanding of antibiotic prophylaxis as outlined in the [American Dental Association's \(ADA\) resources on antibiotic prophylaxis](#).
3. Provide students with in-depth guidelines on appropriate antibiotic prescription, such as the [CDC's Checklist for Antibiotic Prescribing in Dentistry](#).
4. Promote continuing education courses for practicing dentists to ensure they are updated and well-versed on existing antibiotic prescription guidelines.
5. Foster partnerships between dental schools and ERs to respond to patients who arrive at the ER with dental health needs to prevent unnecessary antibiotics from being prescribed.

By educating and training the future dental workforce in antibiotic prescription guidelines, academic dentistry will be part of the solution in combating the growth of antibiotic resistance.

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DENTAL EDUCATORS should consider incorporating appropriate antibiotic prescription practices into dental school curricula and school-based clinics.



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FOR MORE INFORMATION: Contact the ADEA Office of Policy and Education Research (OPER) at policy@adea.org.

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