

# ANTIMICROBIAL STEWARDSHIP FOR DENTAL SETTINGS NEW JERSEY



# Antibiotic Stewardship Toolkit for Dental Providers

The purpose of this toolkit is to provide dentists and dental staff in New Jersey with resources to render appropriate, effective, and safe antibiotic prescribing in dental practices throughout the state. Antibiotic resistance is among the greatest public health threats, leading to more than 2.8 million infections and 35,000 deaths annually, in the United States alone, as of 2019.<sup>1</sup> In community settings, dentists are among the highest prescribers of antibiotics and have an important role to play in ensuring that antibiotics are prescribed only under certain conditions.<sup>2</sup> These are as follows:

- Right drug;
- Right dose;
- Right duration;
- Right diagnosis; and
- When needed.<sup>3 4</sup>

The Centers for Disease Control and Prevention (CDC) recommends that all outpatient health care providers, including dentists, take steps to measure and improve how antibiotics are prescribed using the Core Elements of Outpatient Antibiotic Stewardship as a framework. The four core elements include:

- ▶ **Commitment:** Demonstrate dedication to optimizing antibiotic prescribing and patient safety.
- ▶ **Action for Policy and Practice:** Implement a practice change to improve antibiotic prescribing.
- ▶ **Tracking and Reporting:** Monitor antibiotic prescribing practices.
- ▶ **Education and Expertise:** Provide educational resources to health care providers and patients.

This toolkit is organized around these core elements and includes provider and patient resources. It is intended to be used as a practical action planning guide. For additional information, please visit:

[Core Elements of Outpatient Antibiotic Stewardship | Antibiotic Use | CDC](#) or e-mail at [abxaware@doh.nj.gov](mailto:abxaware@doh.nj.gov)

**“The statements, references, and resources in this toolkit are for guidance purposes and should be used in conjunction with a practitioner’s professional judgment. The New Jersey Department of Health wishes to acknowledge the Kansas Department of Health and Illinois Department of Health for sharing related subject matter for the purposes of creating this content.”**

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1 Centers for Disease Control and Prevention. (2019). Antibiotic/Antimicrobial Resistance. Available at: [www.cdc.gov/drugresistance/index.html](http://www.cdc.gov/drugresistance/index.html)

2 Gouin, et. al. (2022). Identifying Higher-Volume Antibiotic Outpatient Prescribers Using Publicly Available Medicare Part D Data - United States, 2019. Available at: [cdc.gov/mmwr/volumes/71/wr/mm7106a3.htm#T1\\_down](http://cdc.gov/mmwr/volumes/71/wr/mm7106a3.htm#T1_down)

3 Durkin M., Hsueh K., Sallah Y., Feng Q., et al. An evaluation of dental antibiotic prescribing practices in the United States. J Am Dent Assoc. 2017;148(12): 878-86.

4 Lockhart P., Tampi M., Abt E., Urquhart O., et al. Evidence-based clinical practice guidelines on antibiotic use for the urgent management of pulpal and periapical-related dental pain and intraoral swelling. J Am Dent Assoc. 2019;150(11): p906.12.

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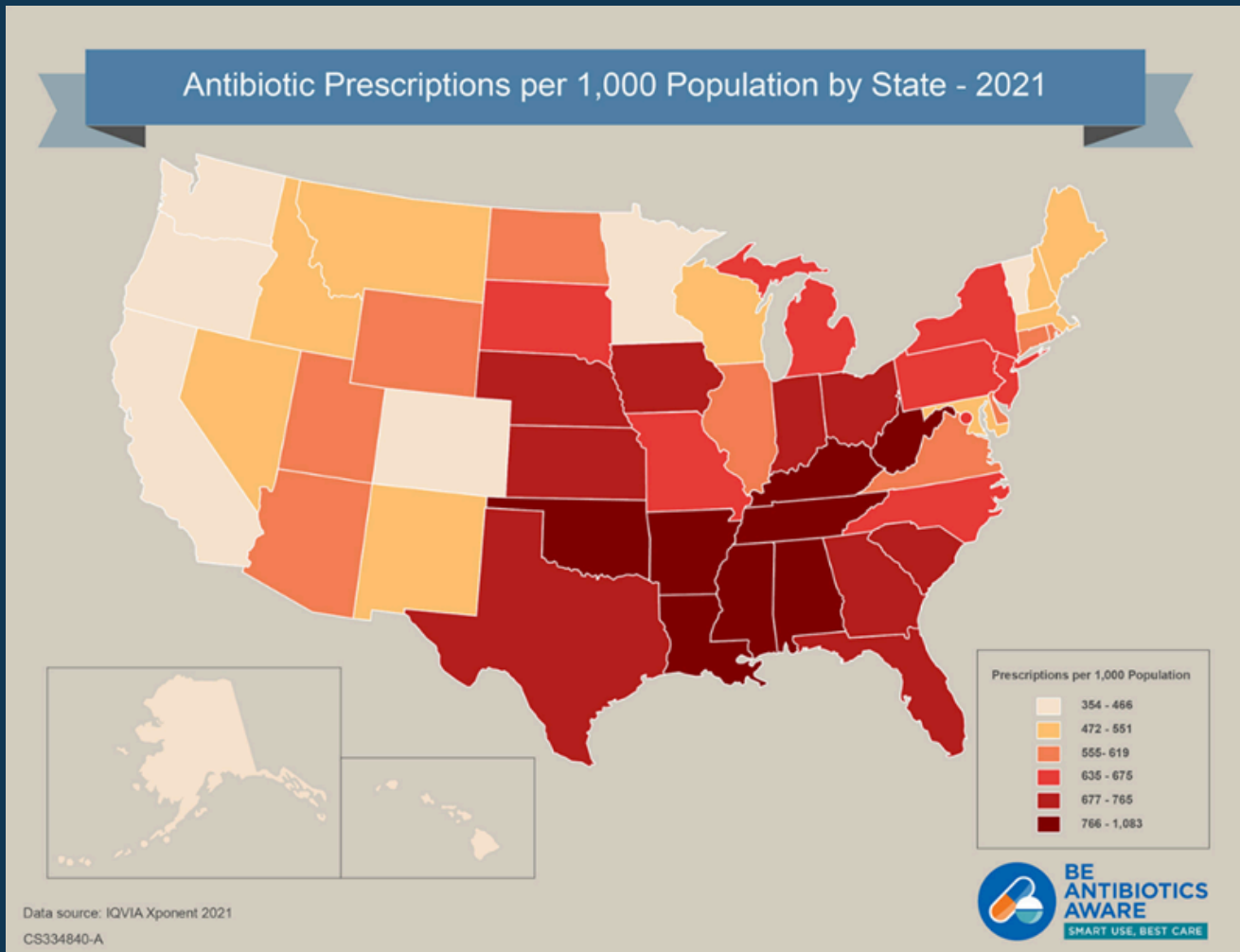
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# Background and Need for Action



# Background

## Antibiotic Prescribing in Outpatient Settings in the United States

- Over 60% of all antibiotic expenditures are associated with the outpatient setting.<sup>5</sup>
- The CDC estimates that at least 30% of antibiotics prescribed in the outpatient setting are unnecessary, meaning no antibiotic was needed at all.<sup>6</sup>
- The national outpatient antibiotic prescription rate in the U.S. was 636 per 1,000 population in 2021.<sup>5</sup>
- The state outpatient prescription rate in NJ was just below this, at 635 per 1,000 population in 2021.<sup>5</sup>

## Antibiotic Prescribing Among Dentists in the United States

- Dentists account for 12% of outpatient antibiotic prescriptions, or 25.5 million prescriptions, with dentists writing an average of 208 prescriptions each in 2021.<sup>5</sup>
- The highest prescribed antibiotics classes prescribed by dentists are penicillins, lincosamides, and macrolides, with amoxicillin, amoxicillin + clavulanic acid, clindamycin, azithromycin, and clarithromycin as the top five agents.<sup>7</sup>
- A retroactive analysis study, assessing the appropriateness of antibiotic prescriptions between 2011–2015, found more than 80% of antibiotics prescribed for infection prophylaxis before dental visits were unnecessary.<sup>9</sup>

## Unintended Consequences of Antibiotic Use

- Antibiotic prescriptions may result in some adverse effects such as hypersensitivity reactions, dermatological disorders, and allergies. Furthermore, unnecessary prescription of antibiotics could result in several serious sequelae, for example, bacterial resistance, gastric and hematological problems, and diversion of bacterial microbiota.<sup>7</sup>
- Antibiotic treatment is the most important risk factor for *Clostridium difficile* infection, which can cause life-threatening diarrhea. There have been studies that found over 40% of patients presenting with *C. difficile* infection visited a dentist or physician's office in the preceding four months<sup>8</sup>.
- The findings are concerning because dentists prescribe a significant proportion of antibiotics and are the top prescribers of clindamycin in the U.S.<sup>9</sup>
- One dose of clindamycin has an equivalent risk of *C. difficile* compared with a prolonged course.
- As of 2019, the CDC estimates that the cost of antimicrobial resistance is \$55 billion every year in the United States, \$20 billion for health care and about \$35 billion for loss of productivity.<sup>10</sup>

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5 Centers for Disease Control and Prevention. (2022). Outpatient Antibiotic Prescriptions – United States, 2021. Available at: <https://www.cdc.gov/antibiotic-use/data/report-2021.html>

6 Centers for Disease Control and Prevention. (2022). Appropriateness of Outpatient Antibiotic Prescribing. Available at: <https://www.cdc.gov/antibiotic-use/data/outpatient-prescribing/index.html>

7 Ahmadi H, Ebrahimi A, Ahmadi F. Antibiotic Therapy in Dentistry. *Int J Dent*. 2021 Jan 28; 2021: 6667624.

8 Roberts RM, Bartoces M, Thompson SE, Hicks LA. Antibiotic prescribing by general dentists in the United States, 2013. *J Am Dent Assoc*. 2017 Mar;148(3):172–178.

9 Suda KJ, Calip GS, Zhou J, Rowan S, Gross AE, Hershow RC, Perez RI, McGregor JC, Evans CT. Assessment of the Appropriateness of Antibiotic Prescriptions for Infection Prophylaxis Before Dental Procedures, 2011 to 2015. *JAMA Netw Open*. 2019 May 3;2(5):e193909. doi: 10.1001/jamanetworkopen.2019.3909. PMID: 31150071; PMCID: PMC6547109.

10 Dadgostar P. Antimicrobial Resistance: Implications and Costs. *Infect Drug Resist*. 2019 Dec 20;12:3903–3910. doi: 10.2147/IDR.S234610. PMID: 31908502; PMCID: PMC6929930

# Need for Action

## Implement the Centers for Disease Control and Prevention's (CDC) Core Elements of Antimicrobial Stewardship for Outpatient Settings



The infographic is a dark blue rounded rectangle containing four white circular icons, each followed by a bold title and a descriptive paragraph. The icons represent: 1. Commitment (two hands shaking), 2. Action for policy and practice (a document with a checkmark), 3. Tracking and reporting (a bar chart), and 4. Education and expertise (two speech bubbles).

- **Commitment**  
Demonstrate dedication to and accountability for optimizing antibiotic prescribing and patient safety.
- **Action for policy and practice**  
Implement at least one policy or practice to improve antibiotic prescribing, assess whether it is working, and modify as needed.
- **Tracking and reporting**  
Monitor antibiotic prescribing practices and offer regular feedback to clinicians, or have clinicians assess their own antibiotic prescribing practices themselves.
- **Education and expertise**  
Provide educational resources to clinicians and patients on antibiotic prescribing, and ensure access to needed expertise on optimizing antibiotic prescribing.

**Read more about the CDC's Core Elements of Antimicrobial Stewardship in Outpatient Settings:**

[https://www.cdc.gov/antibiotic-use/hcp/core-elements/outpatient-antibiotic-stewardship.html?CDC\\_AAref\\_Val=https://www.cdc.gov/antibiotic-use/core-elements/outpatient.html](https://www.cdc.gov/antibiotic-use/hcp/core-elements/outpatient-antibiotic-stewardship.html?CDC_AAref_Val=https://www.cdc.gov/antibiotic-use/core-elements/outpatient.html)

# Core Element 1:



Commitment



# Commitment

**A commitment from your dental practice team members to prescribe antibiotics appropriately and participate in antimicrobial stewardship is critical to improving prescribing measures.**

**There are various ways that your dental office can show commitment:**

- The *New Jersey Department of Health Statement of Leadership Commitment for Antimicrobial Stewardship Letter* can be found and downloaded at: <https://www.nj.gov/health/cd/topics/stewardship.shtml>
- Complete and conspicuously display the *New Jersey Department of Health Statement of Leadership Commitment for Antimicrobial Stewardship Letter* in your office; copies may be made to display it in multiple areas. The copy of the signed letter may also be displayed on your website and/or social media.
- Conspicuously display the *Safe Antibiotic Pledge* poster in your office. Upon registering your office information, you will have the option of downloading a PDF version and/or requesting a physical copy of the *Safe Antibiotic Pledge* poster. Upon request, New Jersey Department of Health will provide you with several posters for display in multiple areas.
- Distribute *Antibiotic Use for a Safe Dental Visit* brochures to raise awareness about the importance and safety associated with appropriate antimicrobial use.
- Similar content is available online from the CDC: [https://www.cdc.gov/antibiotic-use/hcp/educational-resources/stewardship/?CDC\\_AAref\\_Val=https://www.cdc.gov/antibiotic-use/week/toolkit/handouts.html](https://www.cdc.gov/antibiotic-use/hcp/educational-resources/stewardship/?CDC_AAref_Val=https://www.cdc.gov/antibiotic-use/week/toolkit/handouts.html)
- Include antimicrobial stewardship-related duties in job descriptions and/or performance evaluation criteria.
- Educate staff members on how to manage patient expectations on the appropriate use of antimicrobial agents.



# Core Element 2:



Action for Policy and Practice

# Action for Policy and Practice

**Dentists can implement policies and interventions to promote appropriate antibiotic prescribing.**

**Use evidence-based diagnostic criteria, treatment recommendations, guidelines, and practices. Here are some examples:**

- [CDC's Checklist for Antibiotic Prescribing in Dentistry](#)
- [CDC Resource: Treating Patients with Dental Pain and Swelling](#)
- Reference Articles:
  - American Dental Association: [Antibiotic Prophylaxis Prior to Dental Procedures](#)
  - American Heart Association Scientific Statement: [Prevention of Viridans Group Streptococcal Infective Endocarditis](#)
- Quick Reference Guide:
  - The Reference Manual of Pediatric Dentistry: [Use of Antibiotic Therapy for Pediatric Dental Patients](#)

# Core Element 3:



Tracking and Reporting

# Tracking and Reporting

**Tracking and reporting antibiotic prescribing can guide changes in practice and be used to assess progress in improving antibiotic prescribing.**

**Dentists can track and report antibiotic prescribing practices by doing the following:**

- Implement a tracking and reporting system within your practice to monitor antibiotic prescribing and associated details; decide upon the level at which to track and report (i.e., at the individual clinician level (preferred method) or at the facility level), which outcomes to track and report, and how to obtain the data for tracking and reporting.
- It is recommended to track the “4Ds” (drug, dose, duration, and diagnosis); other tracking options include the assessment of high-priority conditions, the percentage of visits that resulted in antimicrobial prescribing, and adverse effects resulting from antimicrobials.
- Self-evaluate individual/office setting practices as compared to those of peers/other practices.
- Participate in continuing education/quality improvement measures related to antimicrobial use. Courses are available online: [Association for Dental Safety](#)
- Assess and share performance on quality measures and established reduction goals addressing appropriate antibiotic prescribing from health care plans and payers.

# Core Element 4:



Education and Expertise

# Education and Expertise

**Dentists can educate colleagues, staff, patients, and families about optimal use of antibiotics and the potential harms associated with unnecessary treatment.**

**Education can improve health literacy and augment efforts to improve antibiotic use with resources and tools available to guide the process as follows:**

- CDC Resources:
  - [Antibiotic Do's and Don'ts at the Dentist](#)
  - [Improving Antibiotic Use](#)
  - [7 Ways Dentists Can Act Against Antimicrobial Resistance](#)
- CDC Printable Educational Materials:
  - [https://www.cdc.gov/antibiotic-use/communication-resources/?CDC\\_AAref\\_Val=https://www.cdc.gov/antibiotic-use/print-materials.html](https://www.cdc.gov/antibiotic-use/communication-resources/?CDC_AAref_Val=https://www.cdc.gov/antibiotic-use/print-materials.html)
- The Journal of the American Dental Association: [What is antibiotic prophylaxis?](#)
- American Heart Association: [Infective Endocarditis](#)

# References

Ahmadi H, Ebrahimi A, Ahmadi F. Antibiotic Therapy in Dentistry. Int J Dent. 2021 Jan 28; 2021: 6667624.

American Dental Association. (2022). Antibiotic Prophylaxis Prior to Dental Procedures. Available at: [ada.org/resources/research/science-and-research-institute/oral-health-topics/antibiotic-prophylaxis](https://ada.org/resources/research/science-and-research-institute/oral-health-topics/antibiotic-prophylaxis)

American Academy of Pediatric Dentistry. Use of antibiotic therapy for pediatric dental patients. The Reference Manual of Pediatric Dentistry. Chicago, Ill.; American Academy of Pediatric Dentistry; 2022:495-9.

American Heart Association. (2021) Prevention of Viridans Group Streptococcal Infective Endocarditis: A Scientific Statement from the American Heart Association. Available at: [ahajournals.org/doi/pdf/10.1161/CIR.0000000000000969](https://ahajournals.org/doi/pdf/10.1161/CIR.0000000000000969)

Centers for Disease Control and Prevention. (2019). Antibiotic/Antimicrobial Resistance. Available at: [cdc.gov/drugresistance/index.html](https://cdc.gov/drugresistance/index.html)

Centers for Disease Control and Prevention. (2022). Outpatient Antibiotic Prescriptions – United States, 2021. Available at: <https://archive.cdc.gov/#/details?url=https://www.cdc.gov/antibiotic-use/data/report-2021.html>

Centers for Disease Control and Prevention. (2022). Appropriateness of Outpatient Antibiotic Prescribing. Available at: [https://www.cdc.gov/antibiotic-use/hcp/data-research/antibiotic-prescribing.html?CDC\\_AAref\\_Val=https://www.cdc.gov/antibiotic-use/data/outpatient-prescribing/index.html](https://www.cdc.gov/antibiotic-use/hcp/data-research/antibiotic-prescribing.html?CDC_AAref_Val=https://www.cdc.gov/antibiotic-use/data/outpatient-prescribing/index.html)

Centers for Disease Control and Prevention. (2021). Core Elements of Outpatient Antibiotic Stewardship. Available at: [https://www.cdc.gov/antibiotic-use/hcp/core-elements/outpatient-antibiotic-stewardship.html?CDC\\_AAref\\_Val=https://www.cdc.gov/antibiotic-use/core-elements/outpatient.html](https://www.cdc.gov/antibiotic-use/hcp/core-elements/outpatient-antibiotic-stewardship.html?CDC_AAref_Val=https://www.cdc.gov/antibiotic-use/core-elements/outpatient.html)

Centers for Disease Control and Prevention. (2022). Handouts and Posters. Available at: [https://www.cdc.gov/antibiotic-use/hcp/educational-resources/stewardship/?CDC\\_AAref\\_Val=https://www.cdc.gov/antibiotic-use/week/toolkit/handouts.html](https://www.cdc.gov/antibiotic-use/hcp/educational-resources/stewardship/?CDC_AAref_Val=https://www.cdc.gov/antibiotic-use/week/toolkit/handouts.html)

Centers for Disease Control and Prevention. (2023). Checklist for Antibiotic Prescribing in Dentistry. Available at: [https://www.cdc.gov/antibiotic-use/media/pdfs/dental-fact-sheet-508.pdf?CDC\\_AAref\\_Val=https://www.cdc.gov/antibiotic-use/community/downloads/dental-fact-sheet-FINAL.pdf](https://www.cdc.gov/antibiotic-use/media/pdfs/dental-fact-sheet-508.pdf?CDC_AAref_Val=https://www.cdc.gov/antibiotic-use/community/downloads/dental-fact-sheet-FINAL.pdf)

Centers for Disease Control and Prevention. (2019). Dentists: Be Antibiotics Aware Treating Patients with Dental Pain and Swelling. Available at: [https://www.cdc.gov/antibiotic-use/media/pdfs/ada-treatment-guidelines-508.pdf?CDC\\_AAref\\_Val=https://www.cdc.gov/antibiotic-use/pdfs/ada-treatment-guidelines-508.pdf](https://www.cdc.gov/antibiotic-use/media/pdfs/ada-treatment-guidelines-508.pdf?CDC_AAref_Val=https://www.cdc.gov/antibiotic-use/pdfs/ada-treatment-guidelines-508.pdf)



# References

Centers for Disease Control and Prevention. (2023). Antibiotic Do's and Don'ts at the Dentist. Available at: [https://www.cdc.gov/antibiotic-use/media/pdfs/dos-and-donts-508.pdf?CDC\\_AAref\\_Val=https://www.cdc.gov/antibiotic-use/community/downloads/dos-and-donts-final.pdf](https://www.cdc.gov/antibiotic-use/media/pdfs/dos-and-donts-508.pdf?CDC_AAref_Val=https://www.cdc.gov/antibiotic-use/community/downloads/dos-and-donts-final.pdf)

Centers for Disease Control and Prevention. (2023). Improving Antibiotic Use. Available at: [https://www.cdc.gov/antibiotic-use/media/pdfs/improving-antibiotic-use-508.pdf?CDC\\_AAref\\_Val=https://www.cdc.gov/antibiotic-use/pdfs/Improving-Antibiotic-Use-508.pdf](https://www.cdc.gov/antibiotic-use/media/pdfs/improving-antibiotic-use-508.pdf?CDC_AAref_Val=https://www.cdc.gov/antibiotic-use/pdfs/Improving-Antibiotic-Use-508.pdf)

Centers for Disease Control and Prevention. (2023). 7 Ways Dentists Can Act Against Antimicrobial Resistance. Available at: <https://stacks.cdc.gov/view/cdc/45103>

Centers for Disease Control and Prevention. (2022). Print Materials. Available at: [https://www.cdc.gov/antibiotic-use/communication-resources/?CDC\\_AAref\\_Val=https://www.cdc.gov/antibiotic-use/print-materials.html](https://www.cdc.gov/antibiotic-use/communication-resources/?CDC_AAref_Val=https://www.cdc.gov/antibiotic-use/print-materials.html)

Dadgostar P. Antimicrobial Resistance: Implications and Costs. Infect Drug Resist. 2019 Dec 20;12:3903-3910. doi: 10.2147/IDR.S234610. PMID: 31908502; PMCID: PMC6929930.

Durkin M., Hsueh K., Sallah Y., Feng Q., et al. An evaluation of dental antibiotic prescribing practices in the United States. J Am Dent Assoc. 2017;148(12): 878-86.

Gouin, et. al. (2022). Identifying Higher-Volume Antibiotic Outpatient Prescribers Using Publicly Available Medicare Part D Data – United States, 2019. Available at: [cdc.gov/mmwr/volumes/71/wr/mm7106a3.htm#T1\\_down](https://www.cdc.gov/mmwr/volumes/71/wr/mm7106a3.htm#T1_down)

Lockhart P., Tampi M., Abt E., Urquhart O., et al. Evidence-based clinical practice guidelines on antibiotic use for the urgent management of pulpal and periapical-related dental pain and intraoral swelling. J Am Dent Assoc. 2019;150(11): p906.12.

The Journal of the American Dental Association. (2016). What is antibiotic prophylaxis? Available at: [jada.ada.org/article/S0002-8177%2816%2930298-7/fulltext](https://jada.ada.org/article/S0002-8177%2816%2930298-7/fulltext)

The American Heart Association. (2021). Infective Endocarditis. Available at: [heart.org/en/health-topics/infective-endocarditis](https://www.heart.org/en/health-topics/infective-endocarditis)

Roberts RM, Bartoces M, Thompson SE, Hicks LA. Antibiotic prescribing by general dentists in the United States, 2013. J Am Dent Assoc. 2017 Mar;148(3):172-178.

Suda KJ, Calip GS, Zhou J, Rowan S, Gross AE, Hershow RC, Perez RI, McGregor JC, Evans CT. Assessment of the Appropriateness of Antibiotic Prescriptions for Infection Prophylaxis Before Dental Procedures, 2011 to 2015. JAMA Netw Open. 2019 May 3;2(5):e193909. doi: 10.1001/jamanetworkopen.2019.3909. PMID: 31150071; PMCID: PMC6547109.