

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 2019.¹ 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.² These are as follows:

- Right drug;
- Right dose;
- Right duration;
- Right diagnosis; and
- When needed.^{3,4}

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 seven core elements include:

- ▶ **Leadership Commitment**
- ▶ **Accountability**
- ▶ **Stewardship Expertise**
- ▶ **Action**
- ▶ **Tracking**
- ▶ **Reporting**
- ▶ **Education**

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

Disclaimer: 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

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

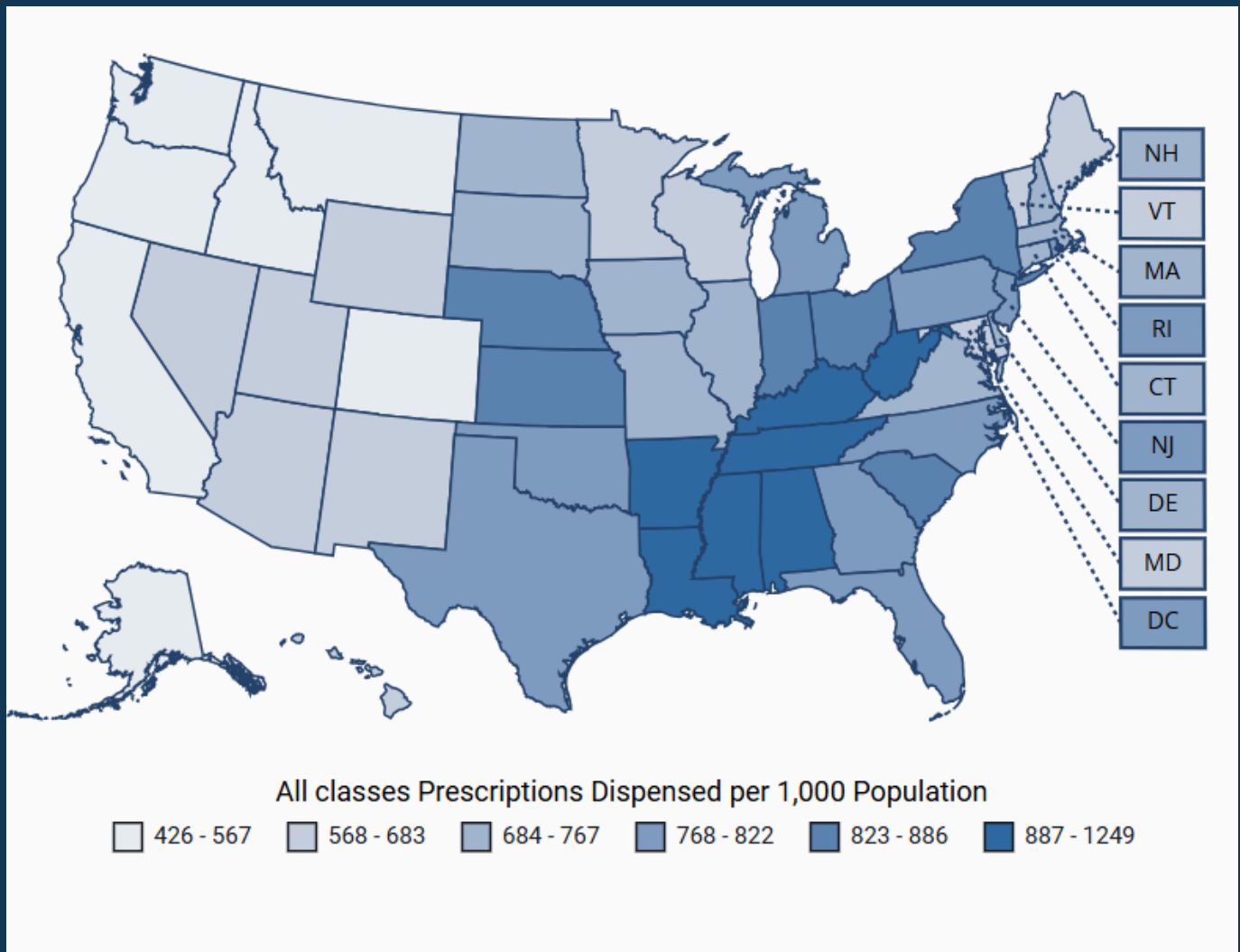
3 Durkin M., Hsueh K., Sallah Y., Feng Q., et al. An evaluation of dental antibiotic prescribing practices in the United States. J Am Dent Assoc. 2017;148(12): 878-86.

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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Outpatient Prescription Rate of All Classes by State in 2024⁵



Background

Antibiotic Prescribing in the United States - Quantitative Summary⁵

- Accounting for oral antibiotic prescriptions in the United States is tracked by the number of prescriptions issued per 1,000 persons for all ages.
- There were an estimated 255.9 million oral antibiotic prescriptions issued in 2024.
- The national outpatient antibiotic prescription rate in the U.S. was 752 prescriptions per 1,000 individuals.
- The state outpatient antibiotic prescription rate in NJ was 791 prescriptions per 1,000 individuals.

Antibiotic Prescribing Patterns in the United States – Qualitative Summary⁵

- The referenced rate was over 3.5 times higher in those of age 20 years or older at the national level.
- The referenced rate was over 1.5 times higher in females as compared to males.
- The geographic prescribing rates, from highest to lowest, were as follows: South, Midwest, Northeast, and West.
- The top antibiotic class prescribing rates, from highest to lowest, were as follows: penicillin, cephalosporins, macrolides, beta-lactams, and tetracyclines.
- The top antibiotic agent prescribing rates, from highest to lowest, were as follows: amoxicillin, azithromycin, amoxicillin-clavulanic acid, doxycycline, and cephalexin.
- Dentists were the third-highest prescribers by specialty in the United States.

⁵ [cdc.gov/antibiotic-use/media/pdfs/2024-Annual-Report-508](https://www.cdc.gov/antibiotic-use/media/pdfs/2024-Annual-Report-508).

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 vertical rectangle containing seven items, each with a circular icon and text. The items are: Leadership Commitment (shaking hands), Accountability (two people), Stewardship Expertise (pill bottle), Action (checklist), Tracking (bar chart), Reporting (virus), and Education (person at a screen).

- Leadership Commitment**
Dedicate necessary human, financial, and information technology resources.
- Accountability**
Designate a leader or co-leaders responsible for outpatient stewardship program development, management, and outcomes.
- Stewardship Expertise**
Pair antibiotic stewardship expertise with outpatient setting-specific clinical expertise.
- Action**
Implement interventions, such as clinical decision support or audit and feedback, to improve antibiotic use.
- Tracking**
Monitor antibiotic prescribing, the impact of stewardship interventions, and other important outcomes.
- Reporting**
Regularly report data on antibiotic prescribing and outcomes to healthcare professionals and leadership.
- Education**
Educate healthcare professionals, patients, and caregivers on optimal antibiotic prescribing, adverse events, and antimicrobial resistance.

Read more about the CDC's Core Elements of Antimicrobial Stewardship in Outpatient Settings and the Antibiotic Stewardship Strategies for Outpatient Dental Settings (site-specific) fact sheet:

<https://www.cdc.gov/antibiotic-use/hcp/core-elements/outpatient-antibiotic-stewardship.html>

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Introduction

Antibiotic stewardship is an effort to improve the treatment of infections, ensure patient safety, and prevent the development and spread of antimicrobial resistance. The goal is to maximize the benefits of antibiotic treatment while minimizing harm to individual patients and communities.



The structure and scope of outpatient stewardship programs and activities will vary depending on the type of setting, as well as size, resources, and the level of integration within a health system. Activities under each Core Element are stratified into two categories:

Priority activities: high impact activities that require organizational-level support for standardized, system-wide implementation.

Additional key activities: activities that can be implemented at the health system level and/or tailored to individual practice settings.

Core Element 1: Leadership Commitment

Support from senior leadership and administrators is critical for ensuring adequate resources, infrastructure, and collaboration to advance outpatient stewardship program efforts system-wide.

Health system-supported Leadership Commitment priority activity:

- Allocate dedicated time and resources for the outpatient stewardship lead to manage and advance the program.

Additional key activities:

- Integrate antibiotic stewardship-related activities into job descriptions and/or performance evaluation criteria.
- Support ongoing education and training.
- Engage key support staff across all disciplines.
- Support the development of clear, system-wide processes.
- Maintain transparent communication to set expectations and reinforce priorities.

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Core Element 1: Leadership Commitment

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: [NJ Department of Health | Communicable Disease Service | Antimicrobial Stewardship](#)

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. Consider downloading several copies of the poster 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: [Antibiotic Stewardship Resource Bundles | Antibiotic Prescribing and Use | CDC](#)

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Core Element 2: Accountability

The antibiotic stewardship program leader is accountable for the program development, management, and outcomes.

Health system-supported Accountability priority activity:

- Designate a stewardship program leader or leaders to develop an outpatient stewardship initiative that sets goals for antibiotic use and aligns its activities with the organization's quality, safety, and operational priorities.

Additional key activities:

- Define clear outpatient stewardship roles and responsibilities for participants across all levels of the program.
- Establish measurable program targets to track progress.
- Integrate stewardship activities into daily practice to reinforce them as a component of high-quality care.
- Report outpatient stewardship activities and outcomes to participants of the program as a means of maintaining group engagement.

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Core Element 3: Expertise

Pairing antibiotic stewardship expertise with outpatient setting-specific expertise is critical for successful stewardship program implementation.

Health system-supported Expertise priority activity:

- Identify staff to support stewardship program leads, champion related activities, and engage clinicians with their outpatient practice.

Additional key activities:

- Engage key/multidisciplinary staff with stewardship activities to ensure increased consistency, acceptability, uptake, and sustainability.
- Ensure that all staff and participants of the program have access to formal stewardship training or certificate programs that are evidence-based and can be combined with feedback on prescribing at the practice.
- Establish partnerships with external experts and professional societies to promote sharing of best practices, problem solving, and expand access to training opportunities, including state and local health departments.

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Core Element 4: Action

Antibiotic stewardship programs can leverage evidence-based interventions to improve antibiotic prescribing and diagnostic testing.

Health system-supported Action priority activity:

- Implement clinical decision support and perform audit-and-feedback based upon health system-specific treatment recommendations.

Additional key activities:

- Select multiple, evidence-based interventions that combine behavioral, educational, and feedback-based approaches that are customized to prescribers and patients.
- Develop treatment plans that incorporate stewardship principles to standardize the diagnosis and management of common infections, where recommendations address appropriate drug selection, dose, and duration when indicated.
- Consider further evaluation of patients with a penicillin allergy, using a stepwise approach and/or making a referral for further analysis.
- Integrate antibiotic stewardship practices within the electronic health record and/or order system by creating order sets for common conditions; they should require clinical indications and justification alerts for any orders that deviate from qualitative or quantitative recommendations.
- Optimize effective feedback interventions to report antibiotic use metrics over time.
- Integrate antibiotic stewardship in quality improvement initiatives, such as those that align with patient safety and coincide with other preventative measures.

The evidence-based interventions to improve antibiotic prescribing include audit-and-feedback, clinical decision support systems, public commitment, accountable justification, communication skill training, delayed prescribing, and performance incentives (See Table 1, Centers for Disease Control and Prevention: The Core Elements of Outpatient Antibiotic Stewardship Programs).

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Core Element 4: Action

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](#)

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Core Element 5: Tracking

Monitoring antibiotic prescribing and outcomes is a central activity of stewardship programs, as tracking enables programs to identify opportunities for improvement, evaluate the effectiveness of interventions, and measure progress toward program goals.

Health system-supported Tracking priority activity:

- Measure antibiotic use, including both quantitative and qualitative features of prescribing. The referenced process can guide changes in practice and assess progress in improving prescribing.

Additional key activities:

- Dedicate information technology resources to automate the monitoring of antibiotic prescribing.
- Monitor composite and condition-specific antibiotic prescribing rates, where applicable; this will potentially help show trends and patterns of prescribing. Balancing measures can be used to reassure prescribers that stewardship practices did not lead to unintended consequences, such as the need for follow-up visits or hospitalization. Similarly, outcome measures such as rate of *Clostridioides difficile* infections, antimicrobial-resistant infections, and adverse drug events would be valuable to assess, but may be difficult to capture in outpatient settings.
- Compare antibiotic use measures, when available and where applicable. This may include comparing prescribing rates between clinicians as compared to other clinicians in the practice, peer comparisons from other practices, or simply comparing prescribing rates, trends, and patterns over time.

Quantitative measures track the volume of antibiotic prescribing; they can assess the overall prescribing rate, prescribing of a specific agent, or use composite measures to assess prescribing for common or high-priority conditions.

Qualitative measures assess the appropriateness of antibiotic prescribing by comparing observed antibiotic practices as compared to treatment recommendations or guidelines.

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Core Element 6: Reporting

Antibiotic stewardship programs should routinely share data and related outcomes with leadership, clinical leaders, participants, and other relevant partners.

Health system-supported Reporting priority activity:

- Report antibiotic use metrics to evaluate prescribing patterns and support effective audit-and-feedback for participants.
- If possible, this can be done electronically through a stewardship dashboard.

Additional key activities:

- Share antibiotic prescribing reports with applicable participants; they can summarize key antibiotic use metrics and highlight recent stewardship program activities, including progress toward established program goals.
- Report clinician and practice antibiotic use and outcome metrics using an electronic format, if possible; referencing antibiotic use metrics with other key outpatient safety and quality measures will serve to increase clinician engagement and provides context to stewardship as part of a broader commitment to quality and safety.

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Core Element 7: Education

Education is a key component of antibiotic stewardship but should not be implemented as an independent intervention; the educational process should include stewardship leaders, staff, participants, and patients.

Health system-supported Education priority activity:

- Provide training on academic detailing for stewardship leaders and all program participants to support effective delivery of evidence-based antibiotic prescribing education, tailored to practice needs.

Additional key activities:

- Use active educational/training techniques, such as workshops, case-based learning, and opportunities that provide continuing education or maintenance-of-certification credits, as these are more effective than those presenting passive learning and can further promote engagement in stewardship education.
- Tailor educational activities to specific clinician groups by aligning content with competencies relevant to their roles and practice settings. Examples of these include training on guidelines for prescribing related to common conditions, effective patient communication, the use of clinical decision support tools, and social and behavioral drivers of inappropriate prescribing, such as concerns about patient satisfaction.
- Engage all staff who interact with patients regarding stewardship activities to ensure consistent communication on appropriate antibiotic use.
- Provide patient educational resources on appropriate antibiotic use, potential adverse events, and antimicrobial resistance during outpatient encounters. Using a variety of multimedia approaches, such as brochures, waiting room videos, QR codes, emails, patient portals, and text messages can help strengthen patient engagement and manage expectations accordingly.
- Participate in U.S. Antibiotic Awareness Week (USAAW), an annual observance that raises awareness about antimicrobial resistance and the importance of appropriate antibiotic prescribing and use for healthcare professionals, patients, and communities.

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Core Element 7: Education

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

- Participate in continuing education/quality improvement measures related to antimicrobial use. Courses are available online:
 - [Association for Dental Safety](#)
- The Journal of the American Dental Association:
 - [What is antibiotic prophylaxis?](#)
- American Heart Association:
 - [Infective Endocarditis](#)
- CDC Resources:
 - [Antibiotic Do's and Don'ts at the Dentist](#)
 - [Improving Antibiotic Use](#)
- CDC Printable Educational Materials:
 - [Patient Education Resources | Antibiotic Prescribing and Use | CDC](#)

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Conclusion and Further Considerations

- Prioritizing interventions based on feasibility, acceptability, resource requirements, and potential barriers to adoption strengthens program effectiveness.
- In terms of smaller programs or independent clinics with limited stewardship capacity and infrastructure, beginning with high-impact activities, such as establishing feedback reports or implementing treatment guidelines for common conditions, and then expanding over time as capacity grows, can help set foundations for stewardship and subsequently facilitate progress.

Antibiotic stewardship activities for outpatient settings with limited stewardship infrastructure, a stepwise and abbreviated approach:

Outpatient settings with limited antibiotic stewardship capacity and infrastructure, including independent clinics and small stewardship programs, can make meaningful progress in improving antibiotic prescribing practices using a multicomponent approach to improve antibiotic use. The following Core Element-based strategies offer a practical and feasible pathway for integrating stewardship into outpatient care.

Leadership Commitment: Adopt and communicate a policy that antibiotics will be prescribed only when clinically indicated and aligned with treatment guidelines.

Accountability: Designate a clinic champion responsible for overseeing antibiotic prescribing improvement activities.

Expertise: Identify an external stewardship expert (e.g., public health partner, academic collaborator, or regional stewardship collaborative member) who can provide periodic consultation on stewardship activities.

Action: Identify one or more high-priority conditions for intervention. Implement a specific action or policy for the selected condition and evaluate changes in prescribing over time. High-priority conditions are commonly encountered with outpatient diagnoses where prescribing frequently deviates from clinical recommendations, including unnecessary antibiotic use or inappropriate selection of agent, dose, or duration. Examples include:

Conditions where unnecessary antibiotics are commonly used

Conditions where inappropriate antibiotic selection, dosing, or duration may occur

Conditions where watchful waiting or delayed prescribing may be appropriate

Conclusion and Further Considerations

Tracking: Select at least one metric to monitor the quantity or quality of antibiotic prescribing. Use a metric that aligns with the high-priority condition(s) chosen for stewardship intervention, if possible.

Reporting: Share reports summarizing antibiotic prescribing at or within the clinic level for the selected metric and highlight ongoing stewardship activities at regular intervals.

Education: Support antibiotic stewardship continuing education relevant to the clinicians' roles and practice settings. Examples include education on guideline-concordant prescribing for common outpatient conditions or strategies for effective patient communication when antibiotics are not indicated.

The Urgent Need for Antibiotic Stewardship in Dentistry

“The appropriate prescribing of antibiotics in dentistry, as in all specialties, is not only a critical public health issue, but also a patient safety and quality improvement issue that warrants immediate attention.”⁶

Further context: The aforementioned quote was the conclusion of a study, resulting from retroactive analysis of dental prescribing habits in 2013, when the national outpatient antibiotic prescription rate in the U.S. was 77.5 prescriptions per 1,000 individuals.

“More than 80% of antibiotics prescribed for infection prophylaxis before dental visits were unnecessary.”⁷

Further context: The aforementioned quote was the conclusion of a study, resulting from retroactive analysis of dental prescribing habits from 2011 to 2015.

“The main goal of this partnership should be decelerating the continuous trends in AMR so that the adverse impacts on society and the economy can be controlled. This will be achieved by establishing a governance mechanism in order to bring harmony to strategic and operational planning. Although the cost of abiding by the guidelines and frameworks can be high, it is well established that the return on such investment will unquestionably have significant positive outcomes. It also provides hope that the adverse impacts of antimicrobial resistance can be mitigated and may not lead to irreversible results for society as a whole.”⁸

Further context: The aforementioned quote was the conclusion of a study published in 2019, exactly 11 weeks before the United States formally declared COVID-19 a national emergency.

6 Roberts RM, Bartoces M, Thompson SE, Hicks LA. Antibiotic prescribing by general dentists in the United States, 2013. J Am Dent Assoc. 2017

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7 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.

8 Dadgostar P. Antimicrobial Resistance: Implications and Costs. Infect Drug Resist. 2019 Dec 20;12:3903-3910. doi: 10.2147/IDR.S234610. PMID: 31908502; PMCID: PMC692993.

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