Commentary

# Infection prevention and antibiotic stewardship in dentistry

## Partnering for a safer future

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In 1736, as fire threatened Philadelphia, Pennsylvania, Benjamin Franklin advised his fellow citizens, "an Ounce of Prevention is worth a Pound of Cure."[1] This adage captures well the goals of infection prevention and control (IPC) and antibiotic stewardship (AS) programs. In hospital settings, IPC and AS programs show good benefit independently, with evidence indicating substantially greater impact when strategically combined. Recognizing this potential, national infection control organizations have recommended increased collaboration between AS and IPC programs.[2] We propose there would be much to gain by integrating AS and IPC programs in dentistry. Collaborative discussion and planning can better leverage the expertise and knowledge of involved oral health care providers within individual IPC and AS programs and enhance the overall effectiveness of both. The programs thus complement each other and work synergistically to improve patient safety and health outcomes.

**Infection control and antibiotic stewardship programs complement each other and work synergistically to improve patient safety and health outcomes.**

IPC is a set of policies, practices, and procedures that reduce the risk of spreading infections to protect health care workers and patients. AS is a coordinated multifaceted program that improves patient outcomes by means of promoting appropriate use of antimicrobials (including antibiotics), reducing microbial resistance, and decreasing the spread of infections caused by multidrug-resistant organisms.[3] By preventing health care–associated infections and promoting appropriate antibiotic use, IPC and AS share the common goal of decreasing the indications for and attendant risks of antibiotic prescribing. More specifically, both programs endeavor to prevent health care–associated infections, such as *Clostridioides difficile* infection (CDI) or antibiotic-resistant infections, to avoid alterations in the microbiome that may result from antibiotic usage and associated diarrhea or other chronic health consequences and to help ensure that antibiotics will remain effective when needed in the future.[4]

### INFECTION PREVENTION PROGRAMS IN DENTISTRY

Within the practice of dentistry, IPC programs were developed and clearly defined by the Centers for Disease Control and Prevention (CDC) via 2 principal publications. The first, *Guidelines for Infection Control in Dental Health-Care Settings: 2003*, serves as the blueprint for infection control and provides the scientific evidence behind the recommendations as well as the strength of each recommendation.[5] The second, *Summary of Infection Prevention Practices in Dental Settings: Basic Expectations for Safe Care*, is a summary of the principal document and provides CDC recommendations published since 2003.[6]

Although the CDC does not have direct regulatory authority to enforce infection control compliance, adherence with accepted infection prevention policies and procedures is strongly supported and expected by accreditation organizations as well as many state, local, and national licensing agencies.

Commentaries represent the opinions of the authors and not necessarily those of the American Dental Association.

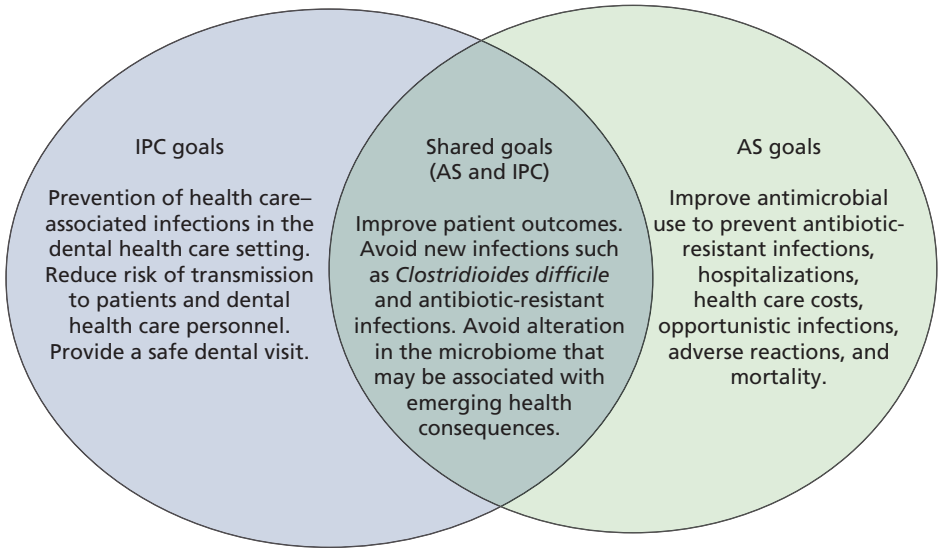


**Figure.** Shared goals between infection prevention and control (IPC) and antibiotic stewardship (AS) programs.

## ANTIBIOTIC STEWARDSHIP IN DENTISTRY

Although infection control programs in dentistry are well defined and broadly implemented, AS programs were introduced within the past decade into the dental setting and have less awareness, acceptance, and structure. The CDC published core elements introduced in 2014 for implementing AS in outpatient health care settings.[7] These core elements include showing commitment to AS principles, implementing policies and practices, tracking and reporting prescribing patterns, and providing educational resources to clinicians and patients. Although the CDC *Core Elements of Outpatient Antibiotic Stewardship* includes dentistry, no specific requirements were set forth for structured dental AS programs in oral health care settings.

To date, there is minimal evidence-based consensus and no regulatory requirements for AS programs in US dental settings. However, similar strategies that have been used in other health care settings have been recommended.[7] A key strategy is to engage and educate all dental team members and patients to raise their awareness about the risks of unnecessary antibiotic use.[8]

## SHARED GOALS OF INFECTION PREVENTION AND CONTROL AND ANTIBIOTIC STEWARDSHIP IN DENTISTRY

Integrated IPC and AS goals share similarities across all health care settings. The programs mutually strengthen and benefit each other, ultimately improving patient safety and outcomes and reducing the risks of health care–associated infections and the need for antibiotics.[2]

Standard precautions (SP) remain the foundation for IPC in dentistry. SP represent basic or minimum infection prevention practices and apply to all patient care activities and settings, regardless of suspected or confirmed infection status.[6] Although SP strategies apply directly to IPC, they also support AS efforts. For example, the practice of hand hygiene helps limit the spread of preventable infections and reduces the indications for antibiotic prescribing. This supports the AS practice of avoiding unnecessary antibiotics or antibiotics with high risk of CDI, such as clindamycin. Both programs complement each other to prevent CDI by blocking exposure (hand hygiene) and limiting alterations of the microbiome (antibiotic). The same synergy of IPC practices (hand hygiene, environmental cleaning) and AS practices (avoiding long durations of broad-spectrum antibiotics) decreases the risk of acquiring antibiotic-resistant pathogens. SP and transmission-based precautions help prevent the spread of all infections, including antibiotic-resistant infections.

The figure illustrates shared goals between IPC and AS programs.

## STEPS TO INTEGRATE ANTIBIOTIC STEWARDSHIP WITH INFECTION PREVENTION

Critical steps for successful implementation of integrated IPC and AS programs include leadership support, team building, policy development, practice flow, education, and program evaluation.

**Box. Paradigm shifts for prescribing antibiotics in dentistry.**

| OLD PARADIGMS | NEW PARADIGMS |
|---|---|
| Prescribe just in case. | Prescribe only when necessary and prescribe according to guidelines. |
| Antibiotics will cure you. | Definitive care will cure you. (Antibiotics are beneficial as an adjunct to definitive, conservative dental treatment in certain clinical situations.) |
| Narcotics are recommended for pain. | Over-the-counter medications will control pain. |
| 10-day duration of therapy is needed. | Prescribe antibiotics to treat infections for 7 days, follow up at 72 hours after a patient starts an antibiotic, and discontinue 24 hours after symptoms resolve. |
| If patient reports penicillin allergy, prescribe alternative antibiotic regimen. | If patient reports penicillin allergy, investigate whether patient has history of anaphylaxis, angioedema, or hives with penicillin, ampicillin, or amoxicillin. Consider referral for penicillin allergy assessment in certain scenarios. |

Source: Lockhart and colleagues.[9]

### Leadership support

The success of any program within a health care facility depends on dynamic and committed administrative and leadership support. Leaders within the organization establish goals and priorities, set the tone, dedicate resources, and ensure the success of the programs.

### Team building

IPC and AS programs require a team leader. The identified infection control coordinator and AS champion collaboratively lead, educate, and train their committed oral health care team members to understand and implement best practices related to IPC and appropriate antibiotic use. Designating a person to lead each program is essential to ensure proper rollout, monitoring, evaluation, and course correction. Because IPC and AS programs share common goals and strategies, the infection control coordinator could also serve as the AS champion or partner with another team member to ensure program success. Ideally, the entire oral health care team will be involved in building and launching the programs, increasing the likelihood of sustained program success. A collaborative team approach also enhances the consistency of patient messaging and communication regarding the need for antibiotics.

### Policy development

The CDC recommends that dental practices maintain a comprehensive written infection control manual that aligns with regulatory requirements and scientific evidence and is tailored to the specific practice location.[6] Staff member familiarity and compliance with the information contained in the document is intended to improve operational efficiency, quality, consistency, and, ultimately, the safety of patients and the oral health care team members. The manual should include standard operating procedures, policy statements, action plans, and references and resources. IPC policies and programs should be collaboratively assessed and updated by the oral health care team members at least annually.[6]

In addition to standard infection control and safety protocols, the manual should include a chapter or section on AS. Incorporating AS information into an existing IPC manual will likely prove to be a more efficient and convenient way to obtain staff member buy-in and adoption than a stand-alone AS manual.

Stewardship topics within the manual may include background information, why stewardship is important in dentistry, and the core elements of outpatient AS: commitment, action, tracking and reporting, and education and expertise.[7] Leadership support from the facility helps ensure the

success of the AS program, including team member commitment, dedication, and accountability for optimizing antibiotic prescribing and patient safety. Implementing AS principles may include paradigm shifts and necessitate updating policies for prescribing antibiotics in dentistry (Box). Additional action items include embracing evidence-based clinical practice guidelines, including the American Dental Association's guidelines for urgent management of dental pain and swelling, guidelines from the American Academy of Pediatric Dentistry, and updates for antibiotic prophylaxis in dentistry.[9-12] Other impactful AS tools include implementing the practice of delayed antibiotic prescribing and early antibiotic discontinuation for situations outlined in the American Dental Association's guidelines, risk assessment for development of CDI as well as routine assessment of penicillin allergies and medical referral for delabeling, ideally before there is a need for an antibiotic to be prescribed.[13,14] Tracking and reporting AS efforts tailored to the oral health care facility will involve auditing antibiotic prescribing practices and providing feedback to prescribers. In small practices, a manual audit may be performed whereas electronic prescription monitoring may be required in larger organizations.

### Practice flow

Designing and incorporating a practice flow can simplify and streamline decision making and operationalize critical AS and IPC practices. In infection prevention, administrative, work-practice, and engineering controls address workplace hazards, improve worker safety, and reduce risk in the daily operations of a dental clinic. Parallel strategies may be used to ensure that AS practices are easily incorporated within daily operations of oral health care delivery. Examples may include incorporating clinical practice guidelines within the dental practice management software prescribing templates or having prescribing expertise or tools readily available at the point of care. By designing a streamlined practice flow, clinical personnel can comply with IPC and AS policies efficiently and effortlessly throughout the workday.

### Education

Effective education and training are essential elements of successful IPC and AS programs. Learning materials and methods must be firmly rooted in adult learning best practices and up-to-date science, recommendations, and standards. AS educational resources should be provided to dentists and oral health care team members to optimize responsible antibiotic prescribing and adherence with recommended prescribing practices. Patients should be informed that antibiotics are not always necessary for bacterial infections and should not be used for viral or fungal infections. Patients should also be instructed about when to seek medical or dental care if their condition worsens or does not improve, when to discontinue their antibiotics, and what to do with leftover medications.

### Program evaluation

IPC and AS programs should be regularly reassessed to ensure effectiveness and efficiency. Policies and interventions must reflect the most up-to-date scientific evidence and consensus best practices. Oral health care team members should continuously monitor, review, and collaboratively develop solutions to identify concerns and problems, ensuring ongoing quality improvement to protect patient safety, improve outcomes, and prevent the spread of infections.

A 2023 survey suggests that dentists have limited access to evidence-based resources to help guide them in their decision-making concerning antibiotic prescription.[15] A valuable resource for the oral health care team members is the Association for Dental Safety. The Association for Dental Safety helps operationalize IPC, AS, safety regulations, guidelines, standards, and best practices to ensure every dental visit is a safe visit.

## CONCLUSIONS

IPC and AS programs both aim to improve health and minimize harm to patients, oral health care team members, and the community at large. They are natural partners in fostering a culture of safety in dentistry. By combining the knowledge and expertise of the IPC and AS team members, dentistry can better leverage and use the talent and experience of team members to help prevent and mitigate the acute and long-term impact of infectious

illness. As we look to the future, implementing these programs will contribute to creating a safer today and tomorrow for us and our children. ■

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## DISCLOSURE

None of the authors reported any disclosures.

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