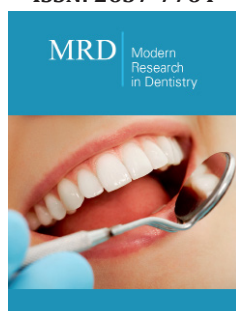


Beyond the Safety Net: Redefining Rational Antimicrobial Prescribing in Modern Dentistry

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Abstract

Background: Dentistry contributes up to 15% of global antimicrobial prescriptions, yet current prescribing practices are characterized by defensive “just in case” approaches that prioritize perceived safety over evidence based clinical necessity. This pattern contributes significantly to antimicrobial resistance while potentially exposing patients to unnecessary risks.

Objective: This opinion article examines the rationality of contemporary antimicrobial prescribing practices in dentistry and proposes a paradigm shift toward evidence-based decision making through the implementation of “watchful precision” approaches.

Main arguments: The dental profession has developed a culture of fear-based prescribing where antibiotics serve as a psychological safety net rather than a therapeutic tool. This defensive posture results in inappropriate prescribing for conditions that would resolve with proper dental treatment alone, contributing to resistance patterns and delaying definitive care. The hidden costs extend beyond immediate clinical encounters to include economic burden, patient safety risks and long-term sustainability concerns.

Proposed solution: The “watchful precision” framework incorporates delayed prescribing strategies, systematic clinical reasoning using the “5Ds” approach [dental treatment, dental condition, drug, dose, duration] and enhanced patient education. This paradigm emphasizes source control through dental intervention over antibiotic reliance and promotes individualized, evidence based therapeutic decisions.

Implementation: Successful transformation requires professional culture change through updated education, interdisciplinary collaboration, technology integration and continuous quality improvement measures. Professional organizations must develop clear guidelines while practitioners embrace antimicrobial stewardship as a core competency.

Conclusion: The dental profession can lead antimicrobial stewardship efforts by abandoning defensive prescribing practices and embracing rational, patient centered approaches that optimize current care while preserving therapeutic options for future generations. This evolution represents both a clinical improvement and a moral imperative for professional responsibility.

Keywords: Antimicrobial stewardship; Dental prescribing; Antibiotic resistance; Delayed prescribing; Evidence-based dentistry

The Paradigm Shift from Fear Based to Evidence Based Practice

The dental profession stands at a critical crossroads in antimicrobial prescribing, where traditional fear based “safety net” approaches must give way to evidence based rational decision making. While dentistry accounts for up to 15% of all antimicrobial prescriptions globally [1], the profession’s approach to antibiotic use has been characterized by a concerning pattern of defensive prescribing that prioritizes perceived safety over scientific evidence. This commentary argues that the time has come for dentistry to abandon its reliance on antibiotics as a professional security blanket and embrace a more nuanced, patient centered approach to antimicrobial stewardship. The concept of “just in case” prescribing has become deeply embedded in dental culture, where antibiotics serve as a psychological safety net for

practitioners facing diagnostic uncertainty or treatment delays [2]. This defensive posture, while understandable from a medicolegal perspective, has created a generation of dental professionals who reach for antibiotics not based on clinical necessity, but as insurance against potential complications. The result is a profession that contributes significantly to the global antimicrobial resistance crisis while potentially exposing patients to unnecessary adverse effects and treatment failures.

The Hidden Costs of Antimicrobial Complacency

The rationality of current antimicrobial prescribing practices in dentistry must be examined through multiple lenses, including clinical effectiveness, resistance patterns, patient safety and long-term sustainability. Recent evidence suggests that dentists often prescribe antibiotics for conditions that would resolve equally well with appropriate dental treatment alone [3]. This practice not only delays definitive care but also perpetuates the misconception that antibiotics can substitute for proper source control through dental intervention. The economic and social costs of inappropriate antimicrobial prescribing extend far beyond the immediate clinical encounter. In the United States alone, antibiotic resistant bacteria result in 23,000 deaths annually [4]. With dental prescribing contributing to this resistance burden through the selection pressure created by unnecessary antibiotic exposure. Moreover, the indirect costs of delayed treatment, repeated consultations and management of antibiotic associated complications represent a significant drain on healthcare resources that could be redirected toward preventive and definitive care. Patient expectations play a crucial role in perpetuating irrational prescribing patterns. Many patients have been conditioned to expect antibiotic prescriptions for dental pain, viewing them as an indicator of thorough care rather than understanding the potential risks and limited benefits. This expectation creates a challenging dynamic where practitioners may feel pressured to prescribe against their clinical judgment, particularly in settings where patient satisfaction scores influence professional evaluations.

A New Framework: The “Watchful Precision” Approach

The solution to irrational antimicrobial prescribing lies not in rigid adherence to restrictive guidelines, but in the development of a more sophisticated decision-making framework that balances evidence-based practice with individualized patient care. The concept of “watchful precision” represents a paradigm shift from reactive prescribing to proactive clinical reasoning, where antibiotics are prescribed only when specific, evidence-based criteria are met. This approach incorporates the proven strategy of delayed prescribing or “watchful waiting,” where patients receive prescriptions to be filled only if symptoms worsen or fail to improve within a specified timeframe [5]. Studies in medical settings have demonstrated that this approach can reduce antibiotic consumption by up to 40% without compromising patient outcomes, yet its adoption in dentistry remains limited. The implementation of delayed prescribing protocols requires careful patient education

and clear follow up instructions but offers the advantage of maintaining the therapeutic relationship while promoting rational antibiotic use. Central to the watchful precision approach is the concept of the “5Ds” in dental antimicrobial prescribing: Dental treatment (source control), dental condition (indication), drug (antibiotic choice), dose and duration [6]. This framework ensures that every antimicrobial prescription is justified by addressing the underlying pathology, selecting appropriate agents, and optimizing dosing regimens while minimizing treatment duration. By systematically considering each element, practitioners can move beyond reflexive prescribing patterns and develop more rational therapeutic strategies.

The Professional Evolution Challenge

The transformation of dental antimicrobial prescribing practices requires more than individual behavior change; It demands a fundamental shift in professional culture and education. Research indicates that dentists practicing for fifteen years, or more are more likely to deviate from evidence-based prescribing guidelines [7], suggesting that established practitioners may require targeted interventions to update their knowledge and modify entrenched practices. This finding highlights the importance of continuous professional development and the need for specialty organizations to actively promote antimicrobial stewardship as a core professional competency [8]. Educational institutions bear responsibility for shaping future prescribing patterns by emphasizing evidence-based decision making and antimicrobial stewardship principles in their curricula. The integration of case-based learning, simulation exercises and interprofessional education with pharmacists and infectious disease specialists can help develop the clinical reasoning skills necessary for rational antimicrobial prescribing. Furthermore, the incorporation of antimicrobial stewardship metrics into quality assurance programs and peer review processes can create accountability mechanisms that reinforce appropriate prescribing behaviors. The role of technology in supporting rational prescribing cannot be overlooked. Electronic prescribing systems with built in decision support tools, antimicrobial prescribing audit capabilities and patient education resources can provide real time guidance and feedback to practitioners. These systems can alert prescribers to potential drug interactions, suggest appropriate dosing regimens, and provide patient education materials that explain the rationale for delayed prescribing or non-antibiotic treatment approaches.

Moving Forward: Practical Implementation Strategies

The transition to more rational antimicrobial prescribing requires practical, implementable strategies that address the real-world challenges facing dental practitioners. Professional organizations must develop clear, evidence-based guidelines that provide specific recommendations for common clinical scenarios while acknowledging the nuances of individual patient presentations [9]. These guidelines should be regularly updated to reflect emerging evidence and resistance patterns, and their dissemination should

be supported by continuing education programs and practice-based learning initiatives. Collaboration with medical colleagues, particularly infectious disease specialists and clinical pharmacists, can enhance dental practitioners' understanding of antimicrobial stewardship principles and provide access to expert consultation for complex cases. Interdisciplinary care models that facilitate communication between dental and medical providers can ensure continuity of antimicrobial management and reduce the risk of duplicative or conflicting prescriptions.

Patient education represents a critical component of successful antimicrobial stewardship implementation. Practitioners must develop effective communication strategies that help patients understand the limitations of antibiotics for dental conditions, the importance of definitive dental treatment and the potential risks associated with unnecessary antibiotic exposure. Educational materials that explain the delayed prescribing approach and provide clear instructions for symptom monitoring can empower patients to participate actively in their care decisions. The measurement and monitoring of prescribing patterns through audit and feedback mechanisms can drive continuous improvement in antimicrobial stewardship practices. Regular analysis of prescribing data, resistance patterns and patient outcomes can identify opportunities for improvement and guide targeted interventions. Professional organizations and regulatory bodies should consider developing benchmarking tools that allow practitioners to compare their prescribing patterns with evidence-based standards and peer benchmarks [10].

Conclusion

Embracing professional responsibility

The rational use of antimicrobials in dentistry requires a fundamental shift from fear based defensive prescribing to evidence based therapeutic decision making. This transformation challenges dental professionals to abandon the false security of "just in case" prescribing and embrace the professional responsibility that comes with antimicrobial stewardship. The implementation of watchful precision approaches, supported by continuing education, technology integration and interdisciplinary collaboration, offers a path forward that preserves therapeutic options for future generations while optimizing patient care in the present. The dental

profession can lead by example in demonstrating how healthcare providers can balance patient care obligations with antimicrobial stewardship responsibilities. By embracing this challenge, dental practitioners can contribute to the global effort to combat antimicrobial resistance while providing more rational, patient centered care that addresses the root causes of dental infections rather than masking symptoms with unnecessary antibiotics. The future of dental practice depends not on the continued availability of broad-spectrum antimicrobials, but on the profession's ability to develop and implement rational prescribing practices that optimize patient outcomes while preserving these crucial therapeutic resources. This evolution in professional practice represents not just clinical improvement, but a moral imperative to ensure that current patients receive optimal care without compromising the therapeutic options available to future generations.

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