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Role of Dentists in Prescribing Opioid Analgesics and Antibiotics: An Overview

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Dentistry, Dental public health, Antibiotics, Opioids, Prescription drugs, Antibiotic stewardship

Key points

- Opioid analgesics and antibiotics as an adjunct or as a definitive treatment for common dental diseases is a useful and cost-effective measure when prescribed appropriately.
- Common dental conditions are best managed by extracting the offending tooth, restoring the tooth with an appropriate filling material, performing a root canal therapy, and/or by fabricating a prosthesis for the edentulous space.
- Appropriate and inappropriate use of antibiotics and opioid analgesics can lead to serious adverse drug events.
- Opioid analgesics prescribed as predefinitive and postdefinitive treatment for dental pain have the potential for misuse, abuse, or addiction.
- Opioid misuse and abuse are strong predictors for adverse events, including overdose.

Introduction

Opioid analgesics and antibiotics prescribed by dentists either as an adjunct or as a definitive treatment for common dental diseases is a useful and cost-effective measure when prescribed appropriately. However, many common dental conditions are best managed by extracting the offending tooth, restoring the tooth with an appropriate filling material, performing a root canal therapy, and/or by fabricating a prosthesis for the edentulous space. The appropriate and inappropriate use of antibiotics and opioid analgesics can lead to serious adverse drug events. For example, the use of antibiotics for dental infection prophylaxis has been associated with *Clostridium* difficile infection[1, 2] and the development of antibiotic resistance.[3, 4, 5] Additionally, antibiotics are frequently associated with hypersensitivity reactions.[3, 4, 5] Opioid analgesics prescribed as predefinitive and postdefinitive treatment for dental pain have the potential for misuse, abuse, or addiction. Opioid misuse and abuse are strong predictors for adverse events, including overdose.[6]

Wall and colleagues[7] reported that antibiotics and pain medication accounted for 3 out of 4 drugs prescribed by dentists to patients. It is estimated that dentists prescribe about 10% of all antibiotics and opioid analgesics nationally,[8, 9, 10] and these prescriptions could contribute to the opioid analgesic epidemic, including cases of overdose in the United States.[6, 11, 12, 13, 14, 15] Dental patients are particularly vulnerable to misuse because they regularly have leftover opioid analgesics that serve as a source for nonmedical use.[8, 11, 12, 13, 14, 15, 16, 17, 18] Persons experiencing antibiotic- and opioid-related adverse outcomes are more likely to visit the emergency department, and it is one of the leading causes of emergency department visits.[19, 20, 21] Furthermore, there is a linear relationship between inappropriate antibiotic and opioid analgesic use and adverse drug reactions.[22, 23] Therefore, dentists must exercise caution in how they prescribe antibiotics and opioid analgesics. Unnecessary and excessive prescribing of opioid analgesics and antibiotics have considerable economic implications. It is estimated that treatment of opioid analgesic overdose, misuse, abuse, and diversion cost public and private insurance companies about $72.5 billion dollars annually.[24, 25] Furthermore, the prescription of antibiotics is among the top therapeutic categories by expenditures in a majority of health care settings.[26, 27]

Dentist prescribing practices of opioid analgesics and antibiotics have continued to receive attention from policymakers, clinicians, and patient care advocates owing to the secondary impact of these medications on population health. Unnecessary prescribing of opioid analgesics is a growing public health concern, and they are the most commonly abused prescription drug prescribed by dentists.[28] Opioid analgesic misuse often starts with either a valid opioid analgesic prescription and/or acquisition of leftover drug from a family member or friend.[6, 17, 18, 28, 29] To highlight and ascertain the state of the science of opioid analgesics in dentistry, a joint meeting was organized by the National Institute of Drug Abuse and the National Institute of Dental and Craniofacial Research.[30] At the meeting, it was concluded that data on dentist prescribing practices of opioid analgesics are scarce and that further investigations are required to better understand the role dentists play in adolescent opioid analgesic

prescribing and the risk and safety associated with adolescent opioid use, as well as identifying potential roles for dentists in terms of how to prevent the opioid analgesic misuse and abuse by adolescents.[30]

Despite this meeting and seminars organized by dental professional organizations, more research is needed to demonstrate specifically the efficacy of nonopioid analgesics in the management of dental pain. In addition, innovative strategies directed specifically at dental professionals will be required to help them to reduce the prescription of opioid analgesics and antibiotics after routine dental procedures. Thus, this article highlights the state of the literature on opioid analgesic and antibiotic prescribing practices in dentistry, the impact of opioid analgesic overdose, and prevention strategies to reduce opioid analgesic and antibiotic overprescription, including public policy considerations.

Opioid analgesic prescribing practices in dentistry

Levy and colleagues[31] examined rates of opioid analgesic prescribing practices by specialty, and found that, of 4.2 billion prescriptions dispensed by US pharmacies and long-term care facilities from 2007 to 2012, 289 million (6.8%) were opioid analgesics. In addition, investigators reported that the greatest percentage decrease in opioid prescribing rates were by emergency physicians (−8.9%) and by dentists (−5.7%).[31] Rasubala and colleagues[32] reviewed data from an urgent dental center in the greater Rochester area in New York. In the study, they found that 25% of patients undergoing tooth extractions or root canal treatments received a prescription for opioid analgesics. Mutlu and colleagues[18] reported that 20% of American oral and maxillofacial surgeons prescribed excessive amounts of opioid analgesics for pain control after third molar extraction.

Pynn and colleagues,[33] in a study conducted in Canada, reported that 93% of dentist respondents prescribe an opioid for patients after removal of impacted third molars. In a more recent study conducted by Steinmetz and colleagues,[34] opioid analgesics were prescribed in 9230 dental visits (2.8%) representing more than 96 million dental visits from 1996 to 2013 in the United States. Guy and colleagues[35] reported that, nationally, rates of opioid analgesics increased from 72.4 to 81.2 prescriptions per 100 persons from 2006 to 2010, remained constant from 2010 to 2012, and then decreased by 13.1% from 2012 to 2015, but that death rates of opioid involved overdose continued to increase.[35] Despite these variations in the rates of opioid analgesic prescribing practices, the prescription of opioid analgesics by dentists is a growing public health concern. In a study based on Medical Expenditure Survey data for 1996 to 2013, investigators found an increased trend of opioid analgesic prescription after most dental procedures. Also reported were the 4 dental procedures (implants, periodontal, root canal, and surgical procedures) with the highest rates of opioid analgesics prescriptions after adjusting for patient characteristics.[34] Additionally, dental patients receive prescriptions for large doses of opioid analgesics after routine dental procedures, with limited monitoring or follow-up on how leftover medications are handled. In another study, based on the 2015 National Survey on Drug Use and Health, approximately 3.8 million people aged 12 or older reported

that they misuse prescription pain relievers.[36] These are all alarming statistics and urgent attention is required to help reduce these unnecessary opioid analgesic prescription practices in the United States.

Opioid analgesic overdose, abuse, and misuse

The World Health Organization document on the management of substance abuse describes opioid overdose as a condition characterized by a combination of 3 signs and symptoms referred to as the "opioid overdose triad."[37] The signs and symptoms are pinpoint pupils, unconsciousness, and respiratory depression. In addition, drug overdose occurs when a toxic amount of a drug, or combination of drugs, overwhelms the body.[38] The National Institute of Drug Abuse describe the misuse of prescription drugs as "taking a medication in a manner or dose other than prescribed; taking someone else's prescription, even if for a legitimate medical complaint such as pain; or taking a medication to feel euphoria (ie, to get high)."[39] In addition, according to the Centers for Disease Control and Prevention, drug diversion is when prescription medicines are obtained or used illegally by a person.[40] According to the National Institute of Drug Abuse, drug addition is a "chronic, relapsing brain disease that is characterized by compulsive drug seeking and use, despite harmful consequences. It is considered a brain disease because drugs change the structure and how the brain works. These brain changes can be long lasting and can lead to many harmful, often self-destructive, behaviors."[41]

The dentist's role in prescribing opioid analgesics is compounded by concerns for abuse, diversion and addiction. The most commonly abused opioid analgesics are immediate release (IR) agents, such as hydrocodone and oxycodone. Dentists frequently prescribe IR agents, prescribing 12% of the overall IR agents prescribed in the United States, just behind family physicians (15% of IR prescriptions).[9] Ashrafioun and colleagues[36] examined the prevalence and association of misuse of opioid analgesic prescriptions in adults seeking dental care. In the study, investigators concluded that the nonmedical use of opioid analgesics was more common in adults seeking dental care than in the general population.

According to a report published by the Centers for Disease Control and Prevention, prescription opioid overdose led to the deaths of more than 33,000 people in 2015, and this was the highest in any year recorded so far.[42] Dodd and Graham[43] reported on inappropriate prescription of analgesics for dental pain at emergency departments in the United Kingdom. On average, it is estimated that more than 1000 people are treated in emergency departments for misusing prescription opioids every day.[44, 45, 46] Some of the factors contributing to the opioid abuse epidemic include easier access to opioids within rural communities and other nonmedical sources.[34, 47] It is recognized that opioids are not nearly as stigmatized or contaminated as illicit drugs, making them seem safer. In addition, health care providers have failed to anticipate the overlap between mental illness, substance abuse, and chronic pain.[34, 48] Furthermore, the low cost of opioid analgesics to the insured consumer may tempt some patients to resell their medication to abusers for a large profit.[34, 46] Opioid prescription misuse and abuse is a significant public health problem requiring urgent attention in the United States.[34] This crisis is receiving national attention from the media, government agencies, professional organizations, and

health science research, with a focus on opioid prescribing practices, abuse, and deaths owing to overdose.

Possible alternatives to opioid analgesics in dentistry

The practice of prescribing opioid analgesics for dental pain management has been based on tradition, expert opinion, practical experience, and uncontrolled anecdotal observations. Nonsteroidal antiinflammatory drugs (NSAIDs) are the preferred analgesic agent when compared with opioid analgesics, because they inhibit inflammatory reactions in addition to providing analgesia.[49, 50] The effectiveness of NSAIDs in alleviating dental pain is well-established; therefore, these agents are considered to be first-line pharmacologic therapies for this indication.[49, 50] In cases of severe pain where NSAIDs are not expected to be sufficient to control acute pain or are contraindicated, opioid analgesics may be considered. However, the potential therapeutic benefits of opioid analgesics must be weighed against any risks of adverse effects and narcotic dependence (which is uncommon when prescribed for no more than 3 days).[51] Recent studies have also evaluated the combined administration of ibuprofen and acetaminophen in patients who can tolerate both classes of drugs, with conclusions that this combination produces greater peak analgesia and more consistent analgesia without increasing adverse effects.[50, 52, 53]

Dental clinics are appropriate settings for provider and patient education on the problems associated with prescription of opioid analgesics. The management of dental pain requires that dental professionals be constantly reminded of the importance of NSAIDs as an adjunct to managing common dental pathologies. Communication among dentists, medical providers, pharmacists, researchers, professional organizations, federal agencies, and health advocates will be required for better coordination of efforts to improve dental prescribing practices of opioids.

Role of dentists in the prevention of opioid misuse

One resource available, but not frequently utilized by dentists, are prescription drug monitoring programs (PDMPs).[29, 54, 55] PDMPs are statewide datasets that collect data on prescriptions dispensed in a specific state for controlled substances with the highest risk of misuse (ie, opioid analgesics). Although the components of each state's PDMP differ, a PDMP generally collects information on schedule II, III, and IV controlled substances received by a patient in the past 6 months (including opioids). With these data, an individual who seeks opioids from different providers may be identified and can be prevented from receiving multiple opioid prescriptions (or other controlled substances) that may be indicative of abuse. Authorities encourage and, in some areas, mandate, prescribers to consult the PDMP before prescribing controlled drugs. However, at this time, PDMP data are not embedded in electronic health records. Thus, providers need to use a separate system to obtain the information in the PDMP.[56] Mandating use of a PDMP by dentists in New York State has been shown to reduce opioid prescriptions and increase the use of nonopioid analgesics.[32]

Prescription of antibiotics in dentistry

Infection-associated inflammation is the most common cause of pain and swelling in the orofacial region. Although there is a need to treat some patients experiencing these symptoms with antibiotics, recent reports have indicated that the majority of cases do not require an antibiotic.[57] Increasing rates of bacterial resistance to antibiotics is a concern in Canada,[58] the United States,[59] and globally.[60] Recently, a National Action Plan for Combating Antibiotic-Resistant Bacteria in the United States was implemented.[61]

The global increase in bacterial resistance to antibiotics has made the management of once manageable infections difficult, extended the complexity of treatment, increased the duration of stay of patients who require hospital care, and increased the financial burden of health services.[62] The indiscriminate use of antibiotics by health care providers has been cited as one of the main contributors to the increase in and spread of antibiotic-resistant infections.[63, 64, 65] Overprescribing of antibiotics is occurring within several areas of health care in Canada,[66, 67] the United States,[68, 69, 70, 71, 72, 73] and has contributed to the development of antibiotic resistance and *C difficile* infections.[1, 5]

The effect of the overprescription of antibiotics in dentistry on overall antibiotic resistance is not clear.[74] However, dentistry prescribes a considerable proportion of antibiotics (7%–11%).[4, 59, 75] By commonly prescribing antibiotics, the demand or expectation of patients to receive future antibiotic prescriptions negatively enforces clinicians to prescribe more to satisfy patients.[76, 77] In 2014, of 31 countries, Canada ranked 12th in the outpatient antimicrobial consumption rate.[78] In the United States, a recent study estimated that nearly 30% of antibiotic prescriptions in primary care medical clinics from 2010 to 2011 were unnecessary.[79]

Treatment of common dental conditions, like all patient care, should be balanced between the need to address the patient's primary complaint and undesirable side effects of the selected treatment. Although this consideration is true of any drug prescribed by a health care provider, it is especially true of antibiotics. Despite receiving specific training regarding common dental diseases and their appropriate management, dentists are prone to prescribing antibiotics in clinical scenarios in which they are not warranted.[3, 4, 80, 81, 82, 83, 84, 85, 86, 87, 88] In fact, available cross-sectional studies have shown that dentists are likely to prescribe antibiotics when unnecessary. Some examples where antibiotics are administered inappropriately in dentistry[3, 59] are as follows: lack of adherence to the current guidelines for indications of antibiotic prophylaxis; prevention of infection after dentoalveolar; periodontal or endodontic surgery; as a postoperative analgesic after endodontic treatment or for endodontic conditions without antibiotic indication; in lieu of proper drainage or after drainage without systemic involvement; for the prevention of metastatic focal infections; or to prevent claims of negligence. Various factors are hypothesized to lead to overprescribing of antibiotics, including (i) an inadequacy of the clinician's knowledge and management of patients with infectious disease, (ii) the expectations and demands of patients, (iii) a clinician's sincere desire to provide what is felt to be the "best treatment" regardless of side effects and costs, (iv) a failure to consider alternative treatments, (v) an

inappropriate use of diagnostic aids, (vi) a fear of medicolegal reprimand, (vii) a belief that newer broad-spectrum antibiotics are the most effective form of treatment, and (viii) the pressures a clinician experiences in running a busy practice (ie, time and economic pressures).[58, 66, 89, 90] Accordingly, it is not clear whether supplementing dentists' didactic knowledge regarding common dental conditions would derive a benefit in terms of reducing inappropriate antibiotic prescribing.

How to improve dentist antibiotic prescribing practices

Antibiotic overprescribing is a multifaceted matter. There have been multiple interventions proposed to health care professionals.[91] Interventions may include dissemination of guidelines to providers, educational meetings and lectures, audit and feedback, clinical decision support systems, mass media campaigns, and delayed prescribing.[91] Practice guidelines are controversial. Although guidelines are seen as helpful in the provision of continuing education and as a support in daily clinical decision making, the most important barrier to successful implementation of clinical practice guidelines is the fear of practitioners that guidelines will reduce their professional autonomy.[92] In fact, in a survey of dentists, only about 50% supported the development and implementation of clinical guidelines.[92] There are various barriers to the use of guidelines, even when guidelines are available.[93, 94] These barriers may include a lack of awareness, lack of familiarity, lack of agreement, lack of self-efficacy, lack of outcome expectancy, the inertia of previous practice, and external barriers.[93, 94] Furthermore, it has been shown that, as a standalone initiative, guidelines may not be effective unless they are specific, uncontroversial, evidence based, and require no change to existing routine.[95, 96] Largely, guidelines are more effective when linked with educational initiatives.[97] Nevertheless, clear guidelines and prescribing policies should be in place as a reference standard to curtail inappropriate antibiotic prescribing practices. Palmer and colleagues[98] recommend that health care professionals need simple, clear, and practical guidelines on when and what to prescribe. Ma and colleagues[99] assessed the effect of guidelines written for physicians and patients for emergency department management of dental emergencies. Their guidelines emphasized appropriate dental clinic referrals and the use of NSAIDs. The implementation of these guidelines led to a significant decrease in visits for dental-related problems, a decrease in the proportion of patients with return visits, and a decrease in the proportion of patients receiving an opioid prescription. It is possible that guidelines may have a similar effect in reducing the antibiotic prescribing practices of dentists.

One study done in the United Kingdom by Palmer and colleagues[98] looked at whether audit, using a combination of guidelines and an educational component with feedback, could improve antibiotic prescribing among practicing general dentists. The information collected included antibiotic regimens, clinically presenting signs and symptoms, medical history, and any other reasons for prescribing before and after the audit, which included an educational component and the issuing of guidelines. After implementation of the intervention, prescriptions for antibiotics decreased by 42.5% in the postaudit period, with a concomitant reduction in the number of prescriptions that did not conform to issued guidelines.[98] This outcome suggests that audit, combined with an educational initiative and guidelines,

may encourage more judicious usage of antibiotics. Another study by Steed and Gibson[100] found similar effects of audit on dentist prescribing patterns, with audit leading to a reduction in prescription writing by approximately 50%.

A study done by Seager and colleagues[101] assessed the effect of educational outreach visits on antibiotic prescribing for acute dental pain among general dentists. In this randomized controlled trial, 3 groups of dentists were randomized to standard practice, receipt of guidelines, or guidelines combined with an educational visit from a trained pharmacist. Dentists receiving the guidelines combined with the pharmacist visit prescribed fewer antibiotic prescriptions to patients with dental pain and significantly fewer inappropriate prescriptions. Interestingly, prescribing practices between the control and guideline-only groups were not significantly different. As such, it was concluded that strategies based on educational outreach visits might be successful in improving antibiotic prescribing practices among dentists.[101]

Which interventions should future policies focus on?

The Centers for Disease Control and Prevention has recently established Core Elements of Outpatient Antibiotic Stewardship.[102] The 4 core elements of outpatient antibiotic stewardship are (1) commitment, (2) action for policy and practice, (3) tracking and reporting, and (4) education and expertise. Outpatient clinicians and facility leaders can commit to improving antibiotic prescribing and take action by implementing at least 1 policy or practice aimed at improving antibiotic prescribing practices. Recommended stewardship strategies may include writing and displaying public commitments in support of antibiotic stewardship, identifying a single leader to direct antibiotic stewardship activities within a facility, including antibiotic stewardship-related duties in position descriptions or job evaluation criteria, and/or communicating with all clinic staff members to set patient expectations. Possible interventions to promote appropriate antibiotic prescribing practices include the use of evidence-based diagnostic criteria and treatment recommendations, the use of delayed prescribing practices or watchful waiting, providing communications skills training for clinicians, requiring explicit written justification in the medical record for nonrecommended antibiotic prescribing, providing support for clinical decisions, and/or using call centers, nurse hotlines, or pharmacist consultations as triage systems to prevent unnecessary visits. Clinicians and leaders of outpatient clinics and health care systems can track antibiotic prescribing practices and regularly report these data back to clinicians. Clinicians can provide educational resources to patients and families on appropriate antibiotic use (ie, use effective communications strategies to educate patients about when antibiotics are and are not needed, educate patients about the potential harms of antibiotic treatment, and/or provide patient education materials). Finally, leaders of outpatient clinics and health systems can provide clinicians with education aimed at improving antibiotic prescribing and access to persons with expertise in antibiotic stewardship (ie, provide face-to-face educational training, provide continuing education activities for clinicians, and/or ensure timely access to persons with expertise).[102]

All of these interventions may be effective. The Centers for Disease Control and Prevention Core Elements recommend implementing local and/or practice-based guidelines, delayed prescribing, communication skills training, documenting a diagnosis with each antibiotic prescription, the use of clinical decision support, and educational strategies. In their 2015 systematic review, Drekonja and colleagues[103] reviewed 50 studies evaluating the effect of outpatient antimicrobial stewardship programs on prescribing, patient, microbial outcomes, and costs. They found medium-strength evidence that stewardship programs incorporating communication skills training and rapid diagnostic laboratory testing are associated with decreases in antimicrobial use, and low-strength evidence that other stewardship interventions (provider and/or patient education, provider feedback, use of guidelines, delayed prescribing, restriction policies, computerized clinical decision support, and/or financial incentives) are associated with improved prescribing practices. Although no included studies reported microbial outcomes, the few studies that reported patient-centered outcomes found no adverse effect resulting from stewardship programs. They concluded that low- to moderate-strength evidence suggests that antimicrobial stewardship programs in outpatient settings improve antimicrobial prescribing without adversely effecting patient outcomes.[103]

A 2017 systematic review focusing on the effect of antibiotic stewardship on the incidence of infections and colonization with antibiotic-resistant bacteria[104] found that antibiotic stewardship programs significantly reduced the incidence of infections and colonization with multidrug-resistant Gram-negative bacteria (51% reduction), extended-spectrum β-lactamase–producing Gram-negative bacteria (48% reduction), and methicillin-resistant *Staphylococcus* aureus (37% reduction), as well as the incidence of *C difficile* infections (32% reduction).[104] Antibiotic stewardship programs were found to be more effective when implemented with infection control measures, especially hand hygiene interventions, than when implemented alone. This systematic review concluded that antibiotic stewardship programs significantly reduce the incidence of infections and colonization with antibiotic-resistant bacteria and *C difficile* infections in hospital inpatients.[104] Overall, it can be concluded that there is “no magic bullet” intervention in changing physicians’ prescribing habits; however, multiple interventions may lead to improved antimicrobial prescribing, without adverse effect to patient outcomes, with a reduction in the incidence and colonization of antibiotic-resistant bacteria.

Delayed prescriptions of antibiotics

As discussed, antibiotics do not relieve dental pain, and the systemic involvement of an oral infection is the only appropriate indication for an antibiotic prescription for patients with nontraumatic dental conditions.[105] When clinicians feel it is safe not to prescribe antibiotics immediately, prescribing none with advice to return if symptoms worsen (before seeing a dental professional for definitive treatment) is an effective and prudent approach. However, in cases where the patient presents with no immediate indication for an antibiotic but where there is fear of future spreading infection or impending systemic involvement, the clinician may consider prescribing a delayed prescription of an antibiotic (ie, providing the prescription but advising the patient to delay its use for 48–72 hours in the hope that

symptoms resolve or do not progress before receiving definitive treatment). A Cochrane Review that evaluated delayed antibiotics for symptoms and complications of acute respiratory tract infections found that delayed prescribing resulted in 32% of patients using antibiotics compared with 93% of patients who received immediate prescriptions (however, not prescribing antibiotics at all resulted in the least antibiotic use—14% of patients).[106] Patient satisfaction was only slightly reduced in the delayed antibiotic group (87% satisfied) compared with the immediate antibiotic group (92% satisfied).[106]

Prescribe Appropriate Antibiotic in a Sufficient Dose and at an Acceptable Duration, Only if Indicated:

The least expensive antibiotic at the narrowest spectrum of activity with the fewest possible side effects should be administered for the shortest duration in the presence of an indication (and not in lieu of a palliative or definitive treatment such as drainage) and when benefits outweigh risks. Because broad-spectrum antibiotics are more likely to lead to resistance, *C. difficile*, and changes in the gastrointestinal microbiota, the American Association for Endodontics recommends clinicians to use narrow spectrum antibiotics (such as penicillin VK or amoxicillin) for first-line therapy to be followed with metronidazole in case of no improvement after 2 to 3 days.[107] In penicillin-allergic patients, clindamycin should be administered.[107] Azithromycin may receive consideration as a third-line choice in those patients who are unable to tolerate penicillins or clindamycin.[107] In regard to antibiotic dosing, the Commission of the Federation Dentaire Internationale suggests that the dose of the antibiotics must be higher than the minimum inhibitory concentration.[108] In practice, antibiotic doses are targeted to be 4 times greater than the minimum inhibitory concentration.[82] When the minimum inhibitory concentration for certain bacterial strains increases, the bacteria are assigned as antibiotic resistant and standard antibiotic dosages may become ineffective to treat infections caused by the cultured organism. Removal of pathogens and/or the source of infection determines the treatment duration.63, 108 For endodontic infections, antibiotics for 5 to 7 days is generally sufficient.[3] At different doses suggested by the British National formulary, 2 to 3 days are recommended.[109, 110] Prescribing antibiotics requiring fewer doses per day are more convenient for patients with improved compliance and tolerability.[109, 110, 111] To prevent microbiological and clinical relapse, antibiotics should be used for a short duration, but in an aggressive manner. Pallasch[112, 113] suggests that clinicians prescribe antibiotics in sufficient doses for 3 to 5 days only, with a follow-up evaluation of the patient.

A variety of practice-altering interventions could be implemented that may subsequently curb the increase in antibiotic resistance and *C difficile* infections if they result in a more judicious use of antibiotics. Studies show that significant changes in prescribing habits reduces the rate at which new antimicrobial resistance accumulates.[63, 75, 114] Reducing antibiotic prescribing at the general practice level results in a reduced incidence of resistance in the local community, demonstrating that modifications in the prescribing habits of individual practitioners can influence the patterns of resistance.[77]

Summary

Opioid analgesics and antibiotics are important pharmacologic agents available to dentists in managing common dental conditions. These agents are generally adjunctive in nature, and there is serious potential for abuse of these agents through unnecessary prescribing practices. Various interventions have been proposed to health care professionals in an attempt to curtail inappropriate prescribing practices. Dentists prescribe a significant proportion of antibiotics and opioids, and curtailing unnecessary dental prescribing can positively impact population health.

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