

Prescribing antimicrobials effectively in dentistry

Resources are available to support the role of the dentist in antimicrobial stewardship.

Background

The discovery of antibiotics revolutionised modern medicine and extended the average human lifespan by 23 years.¹ Antimicrobial resistance threatens to reverse the progress that has been made. In 2019, there were 4.95 million deaths globally associated with drug-resistant bacterial infections.² That figure may rise to as many as 50 million by 2050, making this an unprecedented global public health problem.³

The threat of a post-antibiotic era has prompted the publication of Ireland's One Health National Action Plan on Antimicrobial Resistance (2021–2025).⁴ This National Action Plan advocates for the judicious use of antimicrobials to limit any unintended consequences and antimicrobial resistance. This approach is commonly known as antimicrobial stewardship.

Antibiotic resistance is largely driven by the overuse and misuse of antibiotics in people, animals and in the environment.⁴ Dentists are responsible for approximately 10% of antibiotic prescribing in humans globally.⁵ With several international studies of dental antibiotic prescribing demonstrating that overprescribing occurs frequently,⁵ dentists have an opportunity to contribute significantly to slowing the development and spread of antibiotic resistance by optimising prescribing. This article aims to show how dentists can support good antimicrobial stewardship in their practice.

TIP: The HSE Antibiotic Prescribing website, www.antibioticprescribing.ie, is a reference source that offers up-to-date guidelines for community-based healthcare professionals, including dentists (Figure 1). The website includes treatment tables for dental and oral infections, in addition to safety information such as drug interactions.

Principles of antimicrobial stewardship in dentistry

- Always consider local measures in the first instance, as this may avoid the need for an antibiotic.
- Prescribe an antibiotic only when there is likely to be a clear clinical benefit.
- Antibiotic therapy is not a substitute for dental treatment – the use of antibiotics for dental infection is likely to be as an adjunct to operative intervention or other treatment modalities.
- It is imperative that severe, spreading dental infection should be managed promptly with effective antibiotics and operative management.



FIGURE 1: The HSE Antibiotic Prescribing website, www.antibioticprescribing.ie, offers up-to-date guidelines for community-based healthcare professionals, including dentists.

TIP: In acute dental infection, antimicrobials are generally reserved for cases where there is acute dental pain with associated swelling and any of the following: systemic upset; cellulitis; tender lymphadenopathy; trismus; or, fever.

Considerations when prescribing antimicrobial therapy

Antimicrobial choice

- Where an antimicrobial is indicated, consideration should be given to prescribing the most narrow-spectrum antimicrobial that is likely to be effective (see www.antibioticprescribing.ie).
- Consideration should also be given to the following:
 - previous antimicrobial treatment;
 - the allergy status of the patient;
 - the patient's medical history;
 - other medicines the patient is taking; and,
 - known renal or hepatic impairment.



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Table 1: Antimicrobial prescribing in dentistry: summary guidance for common conditions in adults.⁶

Condition	Where indicated, first-line choice antibiotics for adults (see www.antibioticprescribing.ie for further recommendations)
Acute dento-alveolar infection	Phenoxymethylpenicillin 666mg (Calvepen) or 500mg (Kopen) every 6 hours for 5 days
Periodontal abscess	Or, in penicillin allergy: Metronidazole 400mg every 8 hours for 5 days
Necrotising periodontal disease	Metronidazole 400mg every 8 hours for 3-5 days
Pericoronitis	Metronidazole 400mg every 8 hours for 3-5 days Or Amoxicillin 500mg every 8 hours for 3-5 days
Acute pulpitis	Antibiotics not indicated
Dry socket	Antibiotics not indicated in the absence of spreading infection/systemic symptoms

- The use of clindamycin, co-amoxiclav or cephalosporins is not recommended for the routine management of dental infections. The inappropriate use of these antibiotics can increase the risk of *Clostridioides difficile* infection and antibiotic resistance.

Antimicrobial dose

- Dosing recommendations are available in antimicrobial guidelines such as www.antibioticprescribing.ie.
- In severe infection, the maximum dose of an antimicrobial should be considered.
- For children with a severe infection or at extremes of body weight for their age, the antibiotic dose should be calculated using a weight-based dose (mg/kg). The child's weight should be recorded on the prescription.
- Under-dosing has been shown to be associated with ineffective treatment and increasing antibiotic resistance.
- Overdosing may lead to toxicity and adverse drug reactions.
- Consideration should be given to hepatic and renal impairment, particularly in the elderly.

Antimicrobial duration

- The duration of treatment depends on the severity of the infection and the clinical response, but a recommended treatment duration is detailed in antimicrobial guidelines such as www.antibioticprescribing.ie.
- Unduly prolonged courses of antimicrobial treatment should be avoided as these can promote the development of antimicrobial resistance and adverse effects.

The HSE Dental Antimicrobial Prescribing Guidelines were updated in November 2023 and are accessible from www.antibioticprescribing.ie. In addition to the conditions listed in **Table 1**, the guidelines also cover fungal infections, angular cheilitis, acute sinusitis and antibiotic prophylaxis of infective endocarditis, along with providing general guidance on writing a prescription.

TIP: Antimicrobial medicines should not be disposed of in household waste due to the risk of environmental contamination. Advise patients to return any unused or excess antibiotics to their dispensing pharmacy.

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