



Bugging you to act!



The story of the serendipitous discovery of penicillin by Alexander Fleming may be familiar to many. On 3 September 1928, having returned from holiday, Fleming was going through petri dishes containing colonies of *Staphylococcus* when he observed a zone of inhibition around an area contaminated with mould. The mould, eventually identified as a strain *Penicillium notatum*, appeared to secrete a 'juice' that killed the bacteria.

Although it took another 10 years before the bacteria-killing substance in the 'mould juice' was isolated by Howard Florey, Ernst Chain and colleagues, Fleming's discovery led to the antibiotic age. Since then, other antibiotics, both natural and synthetic, have been discovered, isolated or formulated, helping to treat or prevent many different types of infection, saving countless lives in the process.

Unfortunately, 88 years on, the misuse and over-use of antibiotics has led to the development of bacteria resistant to many antibiotics. Unnecessary and inappropriate prescribing, selection of broad-spectrum or the wrong antibiotics, and incorrect duration or dosage are all contributory factors. In addition, easy access and poorly regulated availability of over-the-counter antibiotics, in some countries, directly purchased for self-medication are also contributory. Furthermore, it is not helped by the agricultural practice of adding low, sub-therapeutic doses of antibiotics to livestock feed and/or water to enhance growth rates, reduce mortality and morbidity, and to compensate for, or cover up, poor husbandry or animal welfare management.

In the UK and the US approximately 10% of antibiotics prescriptions are provided by dentists^{1,2}; this equates to approximately 3.6 million³ and 25.6 million² prescriptions, respectively. Increased antibiotic prescription in dentistry has been reported in a

number of countries^{1,4}. In England alone antibiotic consumption rose by 6% between 2010 and 2013⁵.

The antibiotic resistome genes that contribute to antibiotic-resistance is dynamic and ever expanding. Antibiotic resistance is a real and increasingly serious threat to global public health and patient safety. The rise of superbugs and multidrug-resistant bugs is making news headlines worldwide. In the USA, at least 2 million people suffered antibiotic-resistant bacterial infections and approximately 23,000 people die annually as a direct result². In Europe, every year, 25,000 deaths are attributed to antibiotic-resistant bacteria⁶.

Serious concerns and recognising the urgent need to address antimicrobial, including antibiotic resistance are shared around the world. In July 2014, the UK Government commissioned the O'Neill Review on Antimicrobial Resistance⁷. The National Institute for Health and Care Excellence (UK) has published good practice guidelines on the effective use of antimicrobials⁸. In addition, led by Public Health England (PHE), in collaboration with other UK authorities and administrations, the 'Antibiotic Guardian' initiative was developed to help increase awareness of the problem⁹. The aim is to encourage the general public, students, educators, farmers, veterinary and healthcare communities, and professional organisations to become 'Antibiotic Guardians'. Other similar campaigns include the 'Antibiotic Stewardship Program' promoted by the Centers for Disease Control and Prevention (CDC) in the US¹⁰. To mark the European Commission's public health initiative to raise awareness and as a reminder of the problem of antibiotic resistance, 18 November is designated the annual European Antibiotic Awareness Day. As part of the World Health Organization's global action plan to tackle the growing problem of resistance to antibiotics, 14 to 20 November is World



Antibiotic Awareness Week. Even the United Nations has taken action, recently convening a high-level General Assembly meeting, only the fourth time for a health issue, on the 'fundamental threat' of antimicrobial resistance and in order to look into ways of reducing irresponsible antimicrobial usage.

Most root canal infections consist of a mixture of microbes, with bacteria being the main candidate pathogen. In everyday clinical practice, in spite of antibiotics, there is still no better way of relieving the pain of an acutely infected tooth than local measures, such as drainage. Therefore, antibiotics should be strictly reserved for controlling a spreading infection, if there are signs of systemic involvement, or persistent infection despite operative intervention. We must actively participate in every effort to combat the alarming rise of antibiotic resistance. These include following prudent prescribing advice and adhering to good practice guidelines^{2,5,11,12}. Antibiotics should not be prescribed for the sake of expediency or doled out without second thought.

This editorial may be preaching to the converted. However, time is running out; nothing is lost by maintaining focus on a problem which could spiral out of control.

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