



The attendance at his office last week of a 24-year-old woman for endodontic treatment to a premolar tooth after seven visits with her dentist and three courses of broad spectrum antibiotics has served to jog Ray Bellamy into action to write an article on the use of antibiotics

Most of us, as practising members of the medical profession, are fully aware of the invidious position that we now find ourselves in due to the overuse of antibiotics.

Not that the finger can be pointed at us alone, because the misuse of antibiotics in agriculture is well known and has existed for decades.

The liberal scattering of 56lb bags of antibiotics into animal feed was commonplace in years gone by and may even occur today. Suffice to say, antibiotics are being misused and the consequence of this is that our frontline antibiotics are no longer providing the benefits that they once did.

This leads us to prescribe more complex and expensive drugs that should really be used in the realms of higher medicine for the purpose of saving lives, not teeth.

Anecdotal and scientific evidence suggests that top line antibiotics used in the medical

profession are now often not effective due to the host's previous exposure to the antibiotic through chicken meat consumption and other items in our food chain. This sometimes results in the death of an individual.

Antibiotic-resistant bacteria are present throughout the food chain. Animals and plants are exposed to repetitive small doses because of the use of antibiotics in agricultural feed and fertilizers.

This creates the ideal conditions for resistant strains to thrive. Milk, eggs and meats can all be contaminated with antibiotic-resistant salmonella, for example.

Microbes were the first organisms to evolve on the earth and were its sole inhabitants for billions of years. Only during the last 0.01% of the earth's history have humans been around.

In endodontics we are dealing with a very small number of extremely virulent bacteria. A majority of these can be dealt with by the most common of antibiotics. The problems that arise day after day in my practising life stem from prescriptions that are issued for an inappropriate antibiotic, in inappropriate circumstances at inadequate daily dosage and with no initial loading dose. Often this is succeeded with exactly the

same regime a few weeks later. Clearly this type of prescribing needs to be thought through and the logic questioned. Antibiotics are one of the few drugs that affect not just a single patient but entire populations of individuals through their collective effects on

microbial ecology. Our responsibility lies not only with our own patients but with a world of such patients.

Bacteria from the oral cavity may gain access to the root canal system through caries, exposed pulps or dentine tubules, and cracks in dentine. Other avenues include leaking restorations and apical, lateral or furcal canals affected by advancing periodontal disease and its treatment. Potential sequelae such as pulpitis, draining sinus tract or localised swelling can usually be treated without antibiotics.

The circulation within the inflamed or infected pulp is severely compromised. The pulp in the adult tooth possesses little or no capacity to repair due to the fact that it is a terminal blood supply and is a large amount of tissue with a relatively poor blood supply.

As an antibiotic is carried throughout the body by the vascular system, it is impossible for this antibiotic to reach the bacteria in a therapeutic dose. Consequently, all it can ever do is address the patient's symptoms and never the cause.

I can never understand the rationale of prescribing antibiotics for a patient with a compromised pulpitic tooth. This person needs anti-inflammatory drugs and root canal therapy, not antibiotics. Endodontic treatment, removing the bacteria and their by-products by thoroughly debriding the root canal system, effectively eliminates the infection, curtails the apical inflammation and promotes healing.

Occasionally the infectious process will move beyond the tooth and the exudates may be drained through the tooth by the act of gaining patency. Remember that word? Also, they may be drained by the soft tissue incision of an I and D procedure and, of course, drain naturally by sinus formation. Even if antibiotics are used, the immune system cannot function optimally until the purulence is eliminated. Drainage stimulates healing, relieves pressure, improves circulation and greatly reduces

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bacterial count.

Incidentally, it is my view that the value of incision and drainage for the instant promotion of drainage and acute pain relief is not fully appreciated or utilised by the profession.

When do we need to give antibiotics!

Not as often as we do. Firstly, it needs to be accepted by the dental profession that localised swelling usually does not indicate a requirement for

$$\frac{\text{Remember that infection} = \text{No. of organisms} \times \text{virulence}}{\text{Host resistance}}$$

antibiotics. Secondly, an infection needs to be either persistent or systemic to justify the need for antibiotics. Pain alone or localised swellings do not require antibiotic therapy.

Is the patient in good health? Can they withstand a bacterial challenge? How rapidly did the symptoms occur? What is the extent of the soft tissue inflammation? Do the benefits to the patient justify the risks of antibiotic therapy? Are there signs of regional or systemic involvement?

What dosage!

Administration of these drugs should be short in duration and aggressive to minimise the risk of resistance build-up. The patient must complete the course of prescribed drugs.

A loading dose minimum of 1000mg of Pen VK should be followed by a minimum of 500mg every six hours for five to seven days. Calvapen 666 is perfect in this regard. The patient's response should be closely monitored so that if the response is slow a supplement of Metronidazol may be given; a dose of between 250 and 400mg, once again with a double amount as a loading dose. Clindamycin would also require a loading dose of 300-450mg, followed by 150mg every six hours for seven days.

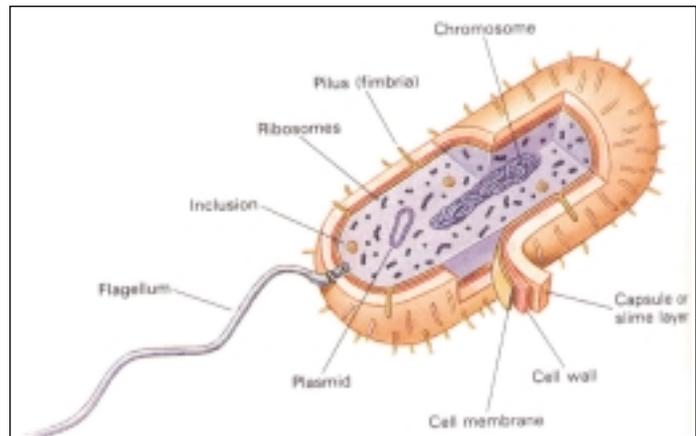
There is a misguided and

widespread belief that antibiotics make recovery from an infection faster, less painful and more certain. Patients are quick to request medication because they believe it will be beneficial. There is no doubt that we as a profession are often guilty of compliance to gain the patient's confidence or, more worryingly, to substitute for other treatment. There is no substitute for cleaning, shaping and filling the root canal system.

So, I intend to outline a few common scenarios that you may come across in your daily general practice. Also, I intend to outline the guidelines for antibiotic prophylaxis in dental procedures.

Case report 1

Jim, a 31-year-old patient seen as an emergency, complains of discomfort on application of temperature, both hot and cold, from a lower molar tooth heavily filled two months ago. The tooth has been sensitive since the



filling was done but he thought that it would settle down. They usually did.

However, the tooth now continues to ache afterwards for several minutes with cold, while hot sends him through the roof. Strangely, he thinks, cold then soothes it. Oral examination reveals a large amalgam filling in LL6. Temperature tests are positive. The heat test is delayed and prolonged. The tooth is

vital. There is no tenderness to palpation or percussion. A radiograph reveals a deeply placed amalgam close to the mesial pulp horn, the pdl appears normal.

A diagnosis of pulpitis is made and, in the limited time available, anaesthesia is given and a pulpotomy is carried out. That is, the occlusal of the tooth is accessed and the pulp chamber is breached, removing all of the roof of the chamber and adjacent caries (bacterial!). A sharp, sterile excavator is used to remove the pulp chamber contents, the chamber washed copiously with sodium hypochlorite and sterile cotton pellet placed within. After a few minutes undisturbed, the pellet is removed and a dry, sterile cotton pellet is again placed in the chamber and the access closed with 4 to 5mm of Cavit G. He is reassured that his discomfort on hot and cold will go. Jim is provided with Nurofen 200mg tablets and instructed to take two tablets every six hours for a couple of days. He is then scheduled for root canal treatment. No antibiotic is necessary.

Case report 2

Mike, who is 47, complains of swelling, pain and limited mouth opening associated with a lower right molar. The pain began several days prior to his visit and is gradually getting worse. He is in good health, he does not have a fever and has no known allergies. Over the last nine months Mike has experienced several less severe episodes of vague pain in the area. These episodes were treated with an

What antibiotic will you give?

- Penicillin VK is effective against most aerobic and anaerobic bacteria that are commonly present in the oral environment.**
- Amoxicillin, a derivative, has a broader spectrum and is a good choice for an immunocompromised patient. However, treatment with amoxicillin increases the likelihood of inducing antibiotic resistance. Penicillin VK is the drug of choice for most oral infections.**
- Clindamycin is an appropriate substitute if the patient is allergic to penicillin. It is beta-lactamase resistant and is highly effective against orofacial infections. Clindamycin has been linked with antibiotic-associated pseudomembranous colitis, but studies show that colitis is a possible side effect of most antibiotics, especially broad spectrum penicillins.**
- Erythromycin, which is commonly prescribed, especially in cases of penicillin allergy, has been shown to be ineffective against most of the anaerobes associated with endodontic infections.**
- Metronidazol is a synthetic antibiotic that is highly effective against obligate anaerobes but not facultative anaerobes, and for this reason is often 'piggybacked' with penicillin as a form of combination therapy.**

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antibiotic and were thought to be sinus related. This lower molar had been crowned in the last three years.

The oral exam revealed the LR6 did not respond to Endo Ice, the tooth was mobile and tender to percussion, and the gum tender to palpation. There is a fluctuant swelling in the vestibular area next to the tooth. Radiographs reveal a well fitting crown, some thickening of the pdl spaces of all the roots. A diagnosis of necrosis/gangrene is made.

After anaesthesia is given, the root treatment is initiated. The tooth is necrotic, four canals are present and these are cleaned and shaped, ensuring that patency is gained to facilitate drainage. Calcium hydroxide is placed into the canals as an inter-appointment medicament and the coronal access closed with IRM over two sterile cotton pellets. Incision and drainage is performed in the vestibule and much exudates is evacuated. A drain is placed to prevent premature closure. Mike is given Nurofen 200mg tablets and instructed to take two tablets every six hours for a couple of days. No antibiotic is necessary.

On his return in four days, the tooth is no longer as tender to bite on, he is no longer swollen, so the drain is removed, the root canals are obturated and the access to pulpal floor is sealed with bonded composite. No antibiotic is necessary.

Case report 3

Janet, a 43-year-old patient, is experiencing pain when she bites against her maxillary right first molar. An examination reveals that this tooth is heavily filled with amalgam but, unlike the contra-lateral side, it is tender to percussion.

The tooth does not respond to electrical tests and a diagnosis of necrosis/gangrene is made. The overlying facial mucosa exhibits a localised, firm swelling. Janet is in good health. She has an aspirin allergy. There is no fever or any other signs of systemic infection.

Anaesthesia is given and the crown of the tooth accessed. The canals are cleaned and

Antibiotic prophylaxis in the prevention of joint infection and heart infection

There are two instances where the practitioner needs to demonstrate knowledge and extra vigilance when dealing with patients.

The first is when the subject is medically compromised if prone to joint infection and the second is if the subject is prone to heart infection.

Antibiotic prophylaxis is not indicated for dental patients with pins, plates and screws. Nor is it indicated for patients with total joint replacements. However, it is advisable to consider premedication in a small number of patients who may be at potential increased risk of haematogenous total joint infection.

Immunocompromised/immunosuppressed

- Inflammatory arthropathies of rheumatoid arthritis or systemic lupus erythematosus.
- Disease, drug or radiation induced immunosuppression.

Other patients

- Insulin dependent (Type 1) diabetes
- First two years following joint replacement
- Previous prosthetic joint infection
- Malnourishment
- Haemophilia

Heart infection

Cardiac conditions associated with endocarditis can be divided into high risk, moderate risk and low or no risk (no greater than the general population). Cover recommended (high and medium risk)

- Prosthetic cardiac valves
- Previous bacterial endocarditis
- Complex and non complex cyanotic congenital disease (e.g. Tetralogy of Fallot)
- Surgically constructed pulmonary shunts
- Rheumatic Heart disease with valvular dysfunction
- Cardiomyopathy and Mitral valve prolapse with regurgitation

For the following dental procedures

- Dental Extractions
- Periodontal procedures
- Dental Implant
- Endodontic treatment beyond the apex or endodontic surgery
- All other procedures where bleeding is anticipated

shaped, and patency attained. There is no drainage evident into the canals. Root canal therapy is carried out in a single visit and

the access closed with IRM over sterile cotton pellets. Janet is completely asymptomatic after three days. No medication was

prescribed. No antibiotic is necessary. Janet did admit to taking a couple of Nurofen as a precaution after her visit.

Prescribing antibiotics

Clinical trials have demonstrated that administering antibiotics before treatment does not reduce the incidence of 'flare ups' following treatment. Only the practice of patency and meticulous attention to length control will eliminate 'flare ups'. To justify the use of an antibiotic in the management of a 'flare up', an infection must be either persistent or systemic.

The routine administration of antibiotics for endodontic treatment is to be discouraged, as it is for routine extraction of teeth or surgical procedures.

Should antibiotics be used to prevent the consequences of bacteraemias that can occur after root canal treatment?

Although the incidence of bacteraemias is low with root canal procedure, antibiotics may be recommended prophylactically for some medically compromised patients.

Note well that there appears to be no justification for the administration of antibiotics for the provision of fillings and other conservative restorative work in medically compromised patients.

In conclusion, it is my fervent desire that each practitioner, when faced with the prospect of prescribing an antibiotic, ask themselves the question as to whether it is really necessary. 

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