Executive Summary

The British Dental Association (BDA) convened an expert summit on 10 November 2014 to lead the UK dental profession in addressing antimicrobial resistance in relation to dentistry. Participants represented all sectors of the dental world, government departments and agencies, and cross-disciplinary and international colleagues. Twelve presentations were heard over the course of sessions covering the public health context, drug development and prescribing, and dentistry-specific issues.

During round-table discussions, delegates then considered the support or changes required to facilitate antimicrobial stewardship by the dental profession. Some key outcomes included the following:

- a need to engage further with the public on the issue of AMR, with reference to disease prevention, management of expectations regarding antimicrobial prescriptions and information the correct use of antimicrobials
- the importance of collaboration between dentists and medical, pharmaceutical, veterinary and international colleagues on AMR
- a need to ensure that all dental students and professionals are adequately trained in diagnosis of the cause of, and treatment planning for, acute dental pain
- a requirement for appropriately funded emergency time to allow dentists to establish a differential diagnosis and provide appropriate interventive treatment when indicated.

This consensus report of the summit will be used as the basis for action and lobbying to support the dental profession in addressing AMR and to facilitate engagement with other organisations and professions.
Antimicrobial resistance (AMR) is a serious threat to public health with the potential to affect all people in every country of the world. As antimicrobial drugs are rendered increasingly ineffective, both common and life-threatening infections will become progressively more difficult to treat and there is a significant risk that many modern surgical and medicinal interventions could become impossible. The urgency of addressing this situation has been highlighted by the World Health Organisation and European Commission, as well as by the UK government. A One Health approach is being promoted, which recognises the intimate connections between human and animal health and calls for concerted, international action on the part of all stakeholders – from governments and non-governmental organisations to human and animal health professionals and the public. Efforts are being directed towards surveillance, preventing infection, preserving the effectiveness of existing drugs and promoting research into new antimicrobial agents and diagnostic technologies.

In the UK, it has been estimated that dentistry accounts for approximately six to nine per cent of total antimicrobial prescribing with dentists normally prescribing from a small, closely circumscribed selection of oral agents on the BNF dental list. A clear link has been established between increasing levels of antibiotic use and resistance, and studies suggest that a significant proportion of cases in which antibiotics are prescribed by dentists could be treated more appropriately with surgical intervention. The dental profession therefore has a role to play in the fight against AMR, principally by helping to conserve the effectiveness of existing drugs; current barriers to reducing inappropriate prescribing must be addressed.

The British Dental Association (BDA) AMR in dentistry summit, held on 10 November 2014, aimed to lead the UK dental profession in addressing AMR in relation to dentistry and contribute to the One Health collaborative approach. The event was registered as a European Antibiotic Awareness Day initiative. Fifty invited delegates represented all sectors of the dental world – including BDA committees and staff, antimicrobial specialists, educators, defence organisations, the Faculty of General Dental Practitioners, the Association of Clinical Oral Microbiologists (ACOM) and the Cochrane Oral Health Group – in addition to the Departments of Health from three UK nations, Public Health England, NICE and cross-disciplinary (medical, pharmacist and veterinary) and international colleagues. Three sessions of presentations addressed the public health context, drug development and prescribing, and dentistry-specific issues. These were followed by round-table discussions, structured around specific questions designed to draw out the actions or changes required to support the dental profession in reducing antibiotic prescribing and contributing to antimicrobial stewardship.

This report summarises the discussions and outcomes of the BDA’s AMR in dentistry summit and sets out some policy recommendations and actions for the BDA and others to help UK dentistry contribute to the fight against AMR.
BDA President Alasdair Miller welcomed participants to the event. Introducing the first session, Susie Sanderson (member of the BDA's Principal Executive Committee and Council member for the Council of European Dentists) thanked the Deputy Chief Medical Officer, Chief Dental Officer and Chief Pharmaceutical Officer (Department of Health, England) for a joint statement issued on the occasion of the BDA summit (attached). This statement emphasised the importance of promoting antimicrobial stewardship and welcomed the BDA's initiative to explore the issue in relation to dentistry.

In his opening presentation, John Watson (Deputy Chief Medical Officer for England) noted that a perfect storm had been created by the confluence of increasing loss of effective antimicrobials to resistance and stalling in the discovery of new antimicrobial agents. Efforts to prevent a return to a pre-antibiotic era had been spearheaded by Chief Medical Officer (England) Dame Sally Davies. A five year cross-government department strategy for the UK had been published in 2013, which saw the Department of Health (DH) tasked with developing measures to prevent infection, preserve existing antimicrobials and promote development of new drugs and approaches. This would be underpinned by surveillance of antimicrobial consumption and resistance, research, the One Health approach and international collaborations; these elements would be led by other government departments and agencies (Public Health England, DEFRA, HEE, BIS, the Foreign Office and DFID), with annual reporting on progress. The ambition and reach of the undertaking were unprecedented; new aspects compared with previous initiatives on AMR included the One Health approach and the degree of international collaboration.

The first year’s achievements had included surveillance work and the publication of prescribing quality measures for primary and secondary care. Activities in the area of diagnostics had included the establishment of a DH diagnostics working group and the announcement of the Longitude Prize competition. Internationally, DH had played a leading role in the World Health Assembly resolution leading to the World Health organisation’s Global Action Plan on AMR. DH was also working with developing countries where antibiotic availability was insufficient but the spread of AMR was being fuelled by a lack of regulation and the prevalence of counterfeit antimicrobial agents. Finally, John Watson highlighted some other initiatives including the World Bank’s review of the economics of drug development and a forum of research funders convened by the Medical Research Council to co-ordinate research in the field of AMR and lead collaboration with European funding agencies.

Sandra White (Director of Dental Public Health, PHE) began by summarising the findings of the first English Surveillance Programme for Antibiotic Utilisation and Resistance (ESPAUR) report, published by PHE in September 2014. This had shown an increase in bloodstream infections, including those resistant to antibiotics, coinciding with increased antibiotic prescribing in 2010-2013. The UK was mid-range among EU countries for antibiotic consumption and resistance, according to surveys by the European Centre for Disease Prevention and Control. Dr White noted that dentists in the UK were estimated to be responsible for up to six per cent of antibiotic prescribing – though a paucity of data, particularly for private practice, meant that this was likely to be an underestimate. The literature suggested that overuse and poor prescribing practices were prevalent among dentists. Future work by PHE would include enhancing community antibiotic consumption databases, promoting the use of stewardship toolkits and scoping how to measure prescribing in private practice. Dr White cited data from the East of England demonstrating that clinical audit, in conjunction with education and prescribing guidelines, could favourably change prescribing patterns among GDPs.
An overview of strategies to improve professional education and public engagement on AMR was provided by Diane Ashiru-Oredope (Pharmacist Lead for AMR, Stewardship and Healthcare Associated Infections at Public Health England; Department of Health AMR and Healthcare Associated Infection (ARHAI) expert advisory committee member). She noted that, at any given time, 30 per cent of patients in secondary care were taking antibiotics, but 80 per cent of prescriptions were issued in primary care. Responsibility for addressing AMR fell to everyone including government, professional bodies, human and animal healthcare professionals, the public and the pharmaceutical industry. Dr Ashiru-Oredope described toolkits that had been developed for both primary and secondary care to promote antimicrobial stewardship (TARGET and Start smart then focus, respectively);10,11 these included audit tools. She suggested that patient information leaflets could be produced specifically for dentistry as a component of the TARGET toolkit. National prescribing and stewardship competencies had been developed by ARHAI for all prescribers and an implementation sub-group established across PHE/HEE; dimensions included infection prevention and control, surveillance of antimicrobial resistance, surveillance of antimicrobial prescribing, antimicrobial stewardship and monitoring and learning (which all independent prescribers must demonstrate).

Dr Ashiru-Oredope then summarised some of the main aims and activities of European Antibiotic Awareness Day (EAAD),9 which had been established in 2008 to raise public and professional awareness of issues surrounding AMR. Key messages for dentists were:

1. In dentistry, there are usually interventions which can be used as first line treatments rather than the prescription of antibiotics.

2. Dental pain is primarily an inflammatory condition, which can be managed by the appropriate use of analgesics and local measures to the site of pain.

3. It is important to educate and communicate with patients about the choices made for management of dental pain.

Educational resources for EAAD were available Europe-wide and included materials for children, dental posters and a toolkit including leaflets, video material and quizzes. Awareness weeks were now also running in the USA, Canada and Australia in conjunction with EAAD. Currently, the EAAD campaign was shifting from awareness towards engagement activities with the Antibiotic Guardian campaign;17 activities would continue year-round. More Antibiotic Guardian pledges were needed from the dental community, and summit delegates were urged to participate and encourage colleagues to do so.

John Blackwell (President, British Veterinary Association; BVA) concluded the first session with a discussion of antimicrobial use and stewardship in veterinary medicine. He explained that there was evidence of animal-human crossover of resistance, but some studies suggested that animals might not be a major source of AMR in human pathogens. Prescribing remained the critical control point, with veterinarians having a “right to prescribe and privilege to dispense”, “as little as possible, as often as necessary”. Antimicrobials were used in animals for curative treatment, metaphylaxis (treatment of a group of animals after a diagnosis of infection in part of the group), and prophylaxis. The latter should be deployed only where there was a high risk of disease and must not be used routinely or systematically, or to compensate for poor infection control/husbandry. There was a need for point of care diagnostics, particularly to help preserve key antibiotics.

The veterinary profession was addressing AMR by: lobbying against unhelpful laws; challenging misconceptions about the causes of resistance; arguing for management of resistance to be based on sound scientific risk assessment and not wholly on the precautionary principle; promoting stricter conditions in best practice for the use of certain categories of antimicrobials that have special importance in human medicine (e.g. fluorquinolones and third/fourth generation cephalosporins); striving for improved animal health management on farms to reduce the need for antimicrobials; and campaigning to raise awareness of the importance of evidence-based responsible antimicrobial use supported by appropriate guidelines and possibly regulation. The BVA had produced guidelines and client education leaflets, and had stewardship running as a theme through its CPD offerings. The association was also working in partnership with other organisations towards One Health objectives. Additional opportunities for action by the veterinary community included further scrutinising methods of using antimicrobials and minimising reliance on them; making every veterinary practitioner aware of the problem; developing further training, education and guidelines; holding every practitioner accountable for antimicrobials used; and being vigilant and responsive as the profession continued to come under fire. Improved antimicrobial usage data for animal medicine were also required.
Opening the second session of talks, Hayley Wickens (Royal Pharmaceutical Society and Consultant Pharmacist, Anti-infectives, University Hospital Southampton NHS Foundation Trust) outlined the reasons for the lack of new antibiotics reaching the market over the last two decades, and described some strategies under consideration to facilitate unblocking of the pipeline. She explained that an arms race had taken place between microbial pathogens and drug development until the 1990s, when disinvestment by pharma had resulted in a discovery void. A number of factors had contributed to this situation, including a reduction in the number of pharmaceutical companies (due to mergers and takeovers) and particular difficulties with progressing new antimicrobials through pre-clinical testing. The success rate of antibiotics in high throughput screens was approximately five-fold lower than for other drugs; further complications included the mutability of the target, bacterial efflux mechanisms and the difficulty of reaching the appropriate body compartment of the host. The economics of antibiotic development and use were also unfavourable: 12 years and £1.2 billion could be required to bring a new drug to market, but usage patterns for antibiotics were not conducive to profit generation (short courses of treatment), and the combination of high dosage and low sale prices made them unattractive for investment. Options under discussion to stimulate the development of new antimicrobials included both the removal of barriers (easing of the regulatory burden or the introduction of earlier licensing with intensive post-market surveillance) and incentives (tax breaks, research and development grants and patent extension). The British Society for Antimicrobial Chemotherapy had initiated an Urgent Need Programme in 2010 to promote action on these issues. Dr Wickens concluded with a brief description of some quality improvement technology available to improve prescribing performance.

A discussion of the antimicrobial prescribing guidance available to dentists in the UK was then presented by Nick Palmer (Faculty of General Dental Practice (UK); FGDP (UK)). Dr Palmer explained that general dental practitioners were estimated to be responsible for approximately nine per cent of the 41.6 million prescriptions for oral antibiotics dispensed in primary care in 2013, with antibiotics comprising 69 per cent of all dental prescriptions. General Dental Council (GDC) regulations required dentists to prescribe only to meet the dental needs of patients. The British National Formulary (BNF) dental list comprised the definitive source of all prescribing information for dentists and stated that prescribing should be based on authoritative guidance and evidence. The FGDP(UK) had published guidance in harmony with that of the BNF but with the additional benefit of providing sources of evidence and a wide range of clinical scenarios; this was available online free of charge throughout November 2014, in recognition of EAAD. Guidance from the Scottish Dental Clinical Effectiveness Programme (SDCEP) was also highly regarded and consistent with the BNF, although it covered a narrower range of clinical conditions than the FGDP(UK) document and contained no supporting evidence. A further national source of guidance was available in the form of the Faculty of Dental Surgery National Clinical Guidelines (1997), which had been produced with Department of Health funding.

Chris Butler (Professor of Primary Care, University of Oxford and Professor of Primary Care Medicine, Cardiff University) described some insights that could be gained from work in primary care medical practice to improve prescribing behaviours. He warned that multi-drug resistance was developing rapidly and that a study of urinary tract infections had indicated that a recent course of antibiotics was the greatest risk factor for the infection harbouring antibiotic resistance. However, people tended to behave rationally in the face of evidence-based advice, and readiness to modify behaviour increased in proportion to the perceived importance of the issue and confidence in the ability to change (feasibility). Professor Butler outlined a trial of STAR (Stemming the Tide of Antibiotic Resistance), a social learning theory-based blended learning programme (online, plus a practice-based seminar). Sixty-eight GP practices had participated, with those in the intervention group receiving information on antibiotic resistance in urine samples from the practice, plus antibiotic prescribing data; these were used to facilitate a practice-based seminar (the “why” of change). Context-bound communication skills training and training on antibiotic indication and choice were also provided to the intervention group (the “how” of change). The primary outcome was the number of antibiotic items dispensed per 1,000 practice patients over 12 months, adjusted for the previous year’s prescribing; secondary outcomes included reconsultation rates, hospitalisation for selected causes and costs. The study found a four per cent reduction in dispensing by the intervention compared with the control group, with no change in reconsultation or hospitalisation and small associated cost saving. These trends were subsequently reproduced in a larger trial involving six European countries, demonstrating that this type of intervention can exert a small but potentially important influence on prescribing behaviour.
Session 3: Antimicrobials in dentistry

The final session of presentations was introduced by Graham Stokes, Chair of the BDA’s Health and Science Committee and Principal Executive Committee member.

An overview of the 17 Cochrane Oral Health library reviews relevant to antibiotic use was provided by Helen Worthington (Professor of Evidence Based Care, University of Manchester School of Dentistry). Antibiotic prophylaxis for infective endocarditis (IE) and treating periodontal disease for glycaemic control had been identified as priority areas.

Professor Worthington explained that the Cochrane analysis had found no evidence for or against the effectiveness of antibiotic prophylaxis for IE, and no clear evidence for risk versus benefit. The review had concluded that practitioners should discuss each case individually with the patient; however, NICE had judged that antibiotic prophylaxis should not be provided for IE as a rule, leading to the strictest guidance in the world. Regarding the treatment of periodontal disease for glycaemic control, some evidence had been found of improvement in metabolic control following antibiotic treatment, though most participants in the studies meeting the Cochrane criteria had poorly-controlled type 2 diabetes, with little data available for type 1; there was a need for larger, carefully-conducted and -reported studies.

A further review examining complications following tooth extraction had found evidence that prophylactic antibiotics could reduce the risk of infection, dry socket and pain following third molar extraction and result in an increase in mild and transient adverse effects. It was unclear whether evidence was generalisable to those with concomitant illnesses or immunodeficiency, or to those undergoing the extraction of teeth due to severe caries or periodontitis. The authors had concluded that, due to the increasing prevalence of bacteria resistant to treatment by currently available antibiotics, clinicians should consider carefully whether treating 12 healthy patients with antibiotics to prevent one infection was likely to do more harm than good.

Cochrane analysis of the effectiveness of prophylactic antibiotics in implant dentistry had found a benefit from prophylaxis corresponding to the survival of one in 25 implants that would otherwise have been lost. Insufficient evidence had been found to support or oppose the use of antibiotics for irreversible pulpitis, symptomatic apical periodontitis or acute apical abscesses. The overall conclusion from the Cochrane reviews on antibiotics in dentistry was that there was often little evidence to support a case for antibiotic use when potential advantages were weighed against detrimental effects.

The findings from a trial assessing the impact of audit and feedback on dental antibiotic prescribing were then discussed by Jan Clarkson (Cochrane Oral Health Group Co-ordinating Editor; Director, SDCEP, NHS Education for Scotland (NES); Director, Effective Dental Practice Programme and Co-Director, Dental Health Services Research Unit, University of Dundee). Professor Clarkson noted that the SDCEP prescribing guidance was issued to most UK dental schools and used for undergraduate teaching. It was known, however, that simply producing and distributing guidance might not influence behaviour. Therefore, NES had funded the Translation Research in a Dental Setting (TRIaDS) programme to embed implementation/translation research within the SDCEP guidance development process and to develop and assess interventions to promote uptake of this guidance. Audits in Scotland had indicated that at least 50 per cent of antibiotic prescribing in dentistry was likely to be inappropriate. Through TRIaDS, the Reducing Antibiotic Prescribing in Dentistry (RAPiD) audit and feedback trial had been carried out to assess the effectiveness of individualised audit and feedback strategies for achieving translation of SDCEP recommendations into practice in Scotland.

This comprised a 12 month randomised trial, in which feedback was provided to dental practitioners with or without the following: a health board mean prescribing comparator; a written behaviour change intervention; additional feedback at nine months. The study group included 2,500 dentists across all general dental practices in Scotland, and the primary outcome was the total antibiotic prescribing rate per 100 courses of treatment over the year following delivery of the baseline intervention. The audit and feedback intervention produced a six per cent reduction in dentists’ antibiotic prescribing rate. The greatest reduction was seen amongst the highest-prescribing group (12 per cent decrease). Sub-group comparisons of the intervention components found a four per cent reduction associated with the health board comparator and six per cent with the text message; the additional feedback at nine months had no effect. This study therefore provided encouraging insights into interventions that could address the problem of inappropriate prescribing in dentistry.
Mike Lewis (Professor of Oral Medicine and Dean, Cardiff University Dental School) discussed undergraduate- and postgraduate-level dental teaching in the use of antimicrobials and issues relevant to resistance. He noted that material presented in dental schools creates a first, and lasting, influence on subsequent prescribing behaviour – with both content and the teacher having an impact – and explained that departments were subject to five-yearly inspection to assess learning outcomes. Professor Lewis presented the findings from a survey sent to UK dental schools on their undergraduate teaching relevant to antimicrobials, covering when the content was delivered during the five year BDS course and how it was assessed. Of the eight dental schools that had responded, all taught mode of action, mechanisms of resistance, indications for use, prescribing practice and the importance of correct prescribing. These issues were covered in varying modules and years of the course and assessed using a range of methods (often multiple short answer or multiple choice questions). The incidence of resistance was taught in all schools that responded, but assessed in only six of the eight. Notably, however, two schools did not teach students about sources of prescribing guidance. Of those that did, all referred students to the BNF as the definitive source, most also cited the SDCEP guidance and some cited the FGDP(UK) guidance and/or local hospital formularies. Furthermore, only two of the eight schools taught audit to inform best practice.

Professor Lewis then discussed postgraduate dental training in relation to AMR and stewardship. Antimicrobial prescribing was a frequent subject of audit projects in dental foundation training; all 70 trainees in Wales over two years had audited their own and their trainer’s prescribing. Postgraduate half-day courses in prescribing were popular; commercial online courses were also available and e-Den provided a free online resource. The learning outcomes mapped well onto the ARHAI stewardship competencies. In conclusion, Professor Lewis raised the possibility that all aspects of antimicrobial prescribing should be taught as a single module within the dental curriculum, with a uniform approach across schools. Advice should be sought from ACOM on how to achieve this.

A presentation by Anwen Cope (Clinical Research Fellow in Dental Public Health, Cardiff University) considered factors influencing antibiotic prescribing by GDPs. She noted that observational studies and clinical audits had suggested that 71-81 per cent of antibiotic prescribing in general dental practice did not conform to recommendations. Data were presented from a mixed methods trial involving GDPs in Wales. This comprised a cross-sectional study of 568 adult patients presenting with an acute dental problem, and examined effects of the clinical management received. Qualitative interviews were also carried out with 19 of the participating dentists, selected to represent diverse demographic groups. The study considered guideline-incongruent (inappropriate) prescribing, where antibiotics were given in cases with no signs of spreading infection or systemic involvement and/or no attempt at operative intervention.

Reasons for inappropriate prescribing were both intrinsic (knowledge or attitudes) and extrinsic (patient factors or healthcare system-related factors). Most GDPs were found to be aware of FGDP(UK) or SDCEP guidelines but demonstrated varying levels of familiarity with them; there was also some disagreement with the guidelines regarding the effectiveness of antibiotics for certain conditions. Prescribing decisions were found to be influenced by a balance between clinical considerations, time/workload pressures and wider concerns about antibiotic use. Most individual practitioners considered themselves average or below average prescribers and many therefore felt a low level of personal responsibility towards AMR. Diagnostic or prognostic uncertainty were implicated in some cases of inappropriate prescribing, and some practitioners reported a fear of complications arising from failure to prescribe. Some evidence was found that patient expectations could influence prescribing decisions, though more research would be required in this area, and patient refusal of operative procedures was found to be a predictor of inappropriate prescribing. The qualitative interviews with GDPs corroborated earlier findings that clinical time pressure (targets and/or profit) was a principal modifier of prescribing behaviour.
Serbjit Kaur (Deputy Chief Dental Officer for England) concluded the presentations with a discussion of dental contract reform with regard to the problem of AMR. She outlined the current coalition government’s commitments relating to dentistry:

1. to improve oral health with particular focus on children
2. to continue to improve access to NHS dental services
3. to reform the dental contract, including piloting.

Dr Kaur noted that an activity-based contract was becoming less relevant as the oral health needs of the nation changed. Improvements had been seen in oral health across the whole population from 1998-2010 and this trend was predicted to continue. Specific aims of the Department of Health included developing continuing care relationships, providing personalised holistic care with a prevention focus, empowering patients to take responsibility for their oral health and continuing to improve NHS access, quality of care and patient experiences/outcomes. Dr Kaur explained that dental contract reform should have a long-term effect of reducing the need for dentists to prescribe antibiotics. The focus on prevention and improving oral health was consistent with the AMR agenda, while improvements in access to routine, urgent and out-of-hours care should reduce the frequency of patients presenting to a GP with oral problems and enable them to be treated by the professional with the most appropriate expertise (the integrated care pathway approach). The goal was a contractual framework that would allow clinicians to provide high quality care, creating the right incentives for appropriate treatment (alongside professional responsibility). Dental contract reform should be viewed in the context of the Department of Health’s five year strategy on AMR. Achievements or plans included: the establishment of an implementation group; an ambition to reduce antibiotic prescribing to 2010 levels in primary care and achieve a five per cent reduction in secondary care; an aim to reduce over-reliance on broad spectrum antibiotics, improving prescribing diversity; and an aim to establish robust surveillance and monitoring systems. Dr Kaur concluded by describing a proposed Information Standard for prescriber IDs, which was currently undergoing an approval process with the Standards Committee for Care Information; a business case for funding the system change would need to be submitted. If introduced, the Standard would enable a move away from shared dedicated prescriber codes to a unique professional body ID (for example, GDC number) for all prescribers, to ensure accurate attribution of prescribing to an individual.
A thematic summary is presented below of the panel question/answer sessions that followed each of the three sets of talks, combined with the outcomes of the round-table discussions. Policy recommendations outlined here represent the consensus position of the summit participants rather than the specific views of the BDA.

1. Patients and the public
   a. The importance of prevention must be highlighted, in the context of reducing the need for antibiotics.
   b. The dental team should be supported to raise awareness of AMR with patients, family members and other personal contacts — via posters, leaflets, advice on disposal of any antimicrobials remaining at the end of a treatment course (this should also be discussed by dispensing pharmacists). A dental-specific campaign similar to that advising patients to treat coughs and colds at home would be helpful.
   c. Dentists should be encouraged to discuss their antibiotic prescribing policy with patients at first contact/medical history taking, rather than when a patient presents in an emergency.
   d. Public education is required on the distinction between analgesics and antibiotics.
   e. Media engagement is essential, and the issue is much broader than dentistry. Awareness can be raised via medical dramas, soaps, etc. A celebrity champion would be valuable, as would a campaign similar to that for drink-driving.
   f. Social marketing and social media campaigns should be used to raise awareness.
   g. National leaders should engage with patient representative groups, using Antibiotic Guardian pledges as a means to reach out to all parts of society.
   h. Public awareness of the role of clinical oral microbiologists should be supported, and these specialists recognised as both dentally- and microbiologically-qualified sources of advice on AMR and infections.*

2. Cross-professional and international collaboration
   a. AMR affects everyone, so a synergistic effort across healthcare sectors and geographical boundaries is required.
   b. Dentistry should be routinely included in all high-level discussion of AMR among policy makers.
   c. The expertise of clinical oral microbiologists should be supported and engaged with in relation to the development of antimicrobial prescribing guidelines, antimicrobial stewardship teaching and training, and promoting infection control best practice.
   d. General medical practitioners should be encouraged to advise patients presenting with dental pain to attend a dentist for the appropriate treatment.†

3. Leadership
   a. There is a need for leadership from the UK Departments of Health. The purpose should be not to add to the burden for dentists, but to co-ordinate approaches to AMR across the dental world and with other healthcare professions; streamlining of efforts is required to avoid duplication and to maximise the impact of available resources.
   b. Discussions and policy making led by the Department of Health in relation to AMR should include the dental profession.
   c. Clinical oral microbiologists trained and qualified in clinical aspects of the management of AMR should be supported at local and national levels to co-ordinate responses by dental healthcare networks.‡

* Recommendation made subsequently by ACOM
† Recommendation made subsequently by BDA Young Dentists’ Committee
‡ Recommendation made subsequently by ACOM
4. Education and training

a. Dental graduates generally possess knowledge of good antimicrobial prescribing but sometimes experience difficulty in translating this into practice; more confidence/training is required in performing appropriate surgical interventions, and more clinical scenarios should be presented within the curriculum.

b. Undergraduate teaching should be aligned to ARHAI competences in a dental-relevant manner, with possible introduction of prescribing competence assessment. A standardised curriculum with respect to antimicrobials should be considered across UK dental schools.

c. Prescribing audit should be taught consistently at undergraduate and postgraduate levels.

d. Each dental school should have access to specialist advice in the form of both dentally and microbiologically-qualified (FRCPath) staff for teaching and training in AMR and infection prevention.\(^5\)

e. Antimicrobial prescribing and stewardship should be a core topic for dental foundation training, including information on sources of guidance.

f. Information on AMR and the Antibiotic Guardian campaign should be disseminated among DFT trainers.\(^**\)

g. CPD on antibiotic prescribing should be aligned with other “core” recommended CPD topics. Dental registrants should be strongly advised to update their knowledge of antibiotic prescribing guidance on a regular basis.

h. The dental profession should work together with medical and pharmacist colleagues on training for non-dental health professionals in handling dental emergencies.

i. Creation of new trainee and consultant posts in clinical oral microbiology is required to support better access to specialised services led by consultants with dual dental and microbiological qualifications (entry to the GDC specialist list in clinical oral microbiology is via completion of the oral microbiology curriculum, overseen by the Royal College of Pathologists). The number of clinical oral microbiologists on the GDC Specialist List (currently eight) in the UK is suboptimal and presents real dangers for the public and concerning access to appropriate infection guidance for the dental profession. A national strategy is needed to create equitable access to specialist advice on AMR as it relates to dentistry.\(^10\)

5 Recommendation made subsequently by ACOM

** Recommendation made subsequently by BDA Young Dentists’ Committee

\(\dagger\dagger\) Recommendation made subsequently by ACOM

5. Data collection and use

a. There is a need for improved collection of dental prescribing data; the Information Standard introducing a unique prescriber identifier (professional registration number) should address this, including facilitating data collection from private practice. Individualised prescribing data should be used as a motivator to encourage behaviour change rather than in a punitive manner (it should be framed as collaboration and learning rather than contract management).

b. Without the ability to prescribe electronically, the collection and provision of comprehensive prescribing data is an excessively onerous and time-consuming task. Consequently, in order to facilitate data collection, electronic prescribing will need to be introduced for dentists in both the NHS and private sectors, and must be appropriately resourced and supported with IT infrastructure.

c. Collection of dispensing data from pharmacists could be considered.

d. Recording of diagnosis in addition to treatment should be considered for dentists; this is already in place for medical colleagues. This could be useful in cases where antibiotics are not prescribed and an adverse clinical outcome occurs, but should not be used for performance management. Appropriate funding and IT resources will be required.

e. Investment should be made in surveillance of antibiotic resistance associated with dentistry.

f. Investment should be made in surveillance of antibiotic resistance in oral pathogens. (Currently only three laboratories in the UK provide clinical oral microbiology services supported by clinical oral microbiologists.) Failure to invest appropriately in this area would create a real risk of losing the current facilities due to the cost-cutting expected with the national strategy of laboratory service centralisation.\(^\dagger\dagger\)

g. Collaboration with ACOM is important for training of both general dental practitioners and dental specialists on the importance of microbiological investigations to guide treatment in difficult cases and to inform the development of empirical prescribing guidelines.

\(\dagger\dagger\) Recommendation made subsequently by ACOM
6. Dental contract reform

a. There is a need for protected and appropriately funded emergency timeslots to be embedded in the new contract (also in out-of-hours services), as dentists are currently experiencing time constraints in treating emergency cases that lead to a pressure to prescribe rather than perform the appropriate surgical procedures. The number of timeslots could be determined by patient demographics and the typical frequency of emergency cases.

b. Similarly for out-of-hours care, some longer timeslots should be available to enable the appropriate emergency treatment to be provided. The difficulty of recalling patients following out-of-hours treatment should also be addressed.

c. Commissioners of dental services should be made aware of the importance of linking with clinical oral microbiologists in the provision of quality care for the management and prevention of infection.

7. Regulation and dento-legal issues

a. Systems must be in place to protect dentists when they make a correct decision not to prescribe antibiotics but an adverse outcome then follows; the potential conflict between responsible prescribing and liability for outcomes must be resolved. Recommendation 5d. above – to record diagnosis in addition to treatment given – may be helpful for this.

b. The current tripartite system of regulation, whereby three different agencies are each responsible for a different aspect, should be clarified:

   GDC – ensures duty of care by the dentist
   CQC – assesses evidence of audit
   NHS – plays a key role in patient safety and performance management.

c. The importance of quality diagnostic samples in the management of infection, and of seeking advice from infection specialists such as clinical oral microbiologists, should be highlighted as best clinical practice when required.

§§ Recommendation made subsequently by ACOM

*** Recommendation made subsequently by ACOM
The following suggestions emerged of activities that could be considered by the BDA (subject to the availability of resources) to promote antimicrobial stewardship in dentistry:

1. Work in partnership with other organisations and disciplines, including the British Medical Association, British Veterinary Association, Royal Colleges, Royal Pharmaceutical Society, Dental Schools Council, ACOM and others; continue dialogue on AMR and hold multi-professional events.

2. Work with the Department of Health on AMR in relation to the development of the reformed dental contract in England; continue to press for a solution that supports stewardship by focusing on disease prevention and improved oral health in addition to including suitably funded emergency time to allow dentists to establish a differential diagnosis and provide appropriate interventive treatment when indicated.

3. Represent dentistry at the Chief Medical Officer’s clinical leaders’ discussions on AMR.

4. Highlight the roles and responsibilities of clinical oral microbiologists to patients, government agencies and the dental profession. Highlight the current absence of NHS trainees and Consultants in Oral Microbiology, and campaign for regional access to infection specialist advice. †††

5. Develop stewardship training for the whole dental team (possibly involving BDA branches and sections). Consider providing triage guidance for reception staff, who are the first point of contact for patients presenting with acute dental pain. Reception staff are not expected or allowed to make a diagnosis, and should certainly not be allowed the responsibility to turn away patients in pain, but with appropriate insight and instruction into the recording of diagnostic factors may be able to assist in scheduling appointments of appropriate length to allow for interventive treatment to be carried out.

6. Produce educational materials for patients/the public, possibly in conjunction with the British Dental Health Foundation (BDHF). Encourage the BDHF to highlight AMR during its Oral Health Month campaign and work together to produce online patient information about antibiotics in dentistry.

7. Embed antimicrobial stewardship criteria in the Good Practice Scheme.

8. Disseminate information to members about prescribing guidance and good practice.

9. Respond to the NICE antimicrobial stewardship guidance consultation (March 2015).

10. Hold a session on AMR at the BDA’s British Dental Conference and Exhibition in Manchester, May 2015.

11. Produce a themed issue of the British Dental Journal on AMR and highlight the subject in other BDA publications and member communications.

12. Liaise with the Shirley Glasstone Hughes primary dental care research trust fund over the possibility of research on patient attitudes to antibiotics in dentistry.

13. Conduct a member survey of frequency of emergency cases seen and time required for treatment.

††† Recommendation made subsequently by ACOM
In recognition of the seriousness of the threat posed by AMR, the BDA is delighted to have been able to bring together so many expert and influential colleagues from across the dental world, as well as cross-disciplinary and international partners, to debate how dentistry can support antimicrobial stewardship. Current barriers to appropriate prescribing were identified and a range of practical recommendations emerged as to how these might be addressed, ranging from public engagement to dental education and training, surveillance and contract reform. This consensus report will be used as the basis for action and lobbying to support the dental profession in addressing AMR, and to facilitate engagement with other organisations and professions. We envisage this as the beginning of a process and look forward to working together with many of the partners represented at the event, and others.

The BDA would like to thank all of the summit participants for their helpful input on the day and in the preparation if this report, and is particularly grateful to the speakers for their contributions.
References

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