Antibiotic prophylaxis in dentistry: part I. A qualitative study of professionals' views on the NICE guideline

S. Soheilipour,[1] S. Scambler,[2] C. Dickinson,[3] S. M. Dunne,[4] M. Burke,[5] S. E. Jabbarifar,[6] and J. T. Newton[7]

IN BRIEF

- The appropriateness of the NICE guideline in all cases, particularly for those with the highest risk, was an important concern in the absence of strong evidence.
- Conflicting advice from cardiologists clearly influenced dentists' ability to implement the guideline.
- Professionals felt responsibility to take into account individual patient's needs and requests and adapt the guideline to suit circumstances.

RESEARCH

Background The NICE guideline for antibiotic prophylaxis before dental treatment has made a substantive change and fundamental departure from previous practice that affects long-standing beliefs and practice patterns. There is potential difficulty for healthcare professionals explaining the new guidance to patients who have long believed that they must receive antibiotics before their dental treatment. **Aim** To explore clinicians' attitudes towards the NICE guidance on antibiotic prophylaxis, their use of the guideline in clinical practice, barriers to the implementation of the guideline, and how best to overcome any perceived barriers. **Methods** In-depth interviews were conducted with seven dental care professionals, two cardiologists and a cardiac care nurse. The data were analysed using the framework method to extract central themes and opinions. **Results** Clinicians generally perceived that initially patients would be reluctant to follow the NICE guidance. This was felt to be particularly true of the patient cohort that had previously been prescribed prophylactic antibiotics. They found it difficult to explain the new guidance to patients who have had infective endocarditis and have long believed that they must receive antibiotics before their dental treatment. Concerns were also raised about the legal position of a clinician who did not follow the guidance. Clinicians generally suggested that the provision of accurate information in the form of leaflets and valid websites would be the best way to advise patients about the new guidance. **Conclusions** Clinicians anticipated difficulties in explaining to patients the change in clinical practice necessitated by adherence to the NICE guidance, most notably for patients with a history of infective endocarditis or where the patient's cardiologist did not agree with the NICE guidance. They placed particular emphasis on the provision of accurate information in order to reassure patients.

[1]*Department of Oral Health Services Research & Dental Public Health, GKT Dental Institute, King's College London, Caldecot Road, Denmark Hill, London, SE5 9RW/ Member of Faculty, Department of Community Dentistry, Dental School, Isfahan University of Medical Sciences, Isfahan, Iran; [2]Lecturer in Sociology, Department of Oral Health Services Research & Dental Public Health, GKT Dental Institute, King's College London, Caldecot Road, Denmark Hill, London, SE5 9RW; [3]Consultant in Special Care Dentistry, Guy's and St Thomas' NHS Foundation Trust, Floor 26, Guy's Tower, Guy's Hospital, London, SE1 9RT; [4]Professor in Primary Dental Care, Head of Dental Practice and Policy, Department of Primary Dental Care, King's College London, Caldecot Road, Denmark Hill, London, SE5 9RW; [5]Consultant in Special Care Dentistry, Guy's and St Thomas' NHS Foundation Trust, Floor 26, Guy's Tower, Guy's Hospital, London, SE1 9RT; [6]Associate Professor in Pediatric Dentistry, Department of Pedodontics, Dental School, Isfahan University of Medical Sciences, Isfahan, Iran; [7]Professor of Psychology as Applied to Dentistry, Deputy Director of Research & Development, Head of Oral Health, Workforce & Education Research Group, Department of Oral Health Services Research & Dental Public Health, King's College London, Caldecot Road, Denmark Hill, London, SE5 9RW
*Correspondence to: Shimae Soheilipour
Email: sh_soheilipour@yahoo.com;
Tel: +44 (0)203 299 3481; Fax: +44 (0)203 299 3409

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INTRODUCTION

For 50 years, since the American Health Association (AHA) published the first guidelines on the prevention of infective endocarditis (IE), patients and healthcare providers have assumed that antibiotics administrated at the time of invasive dental procedures effectively prevented IE in patients with underlying cardiac risk factors.[1] Patients were educated to this effect and healthcare providers, especially dentists, were expected to prescribe antibiotic prophylaxis (AP). Patients that had a lifetime risk of developing IE had a sense of reassurance and comfort that antibiotic cover was effective and safe, while the healthcare professionals felt a sense of obligation and legal responsibility to protect their patients from IE that might result from a bacteraemia-producing procedure.[2] Recently, however, there has been considerable debate about the role of antibiotic prophylaxis for those susceptible to IE.

The lack of strong evidence to prove the association between IE and dental procedures, and for the efficacy of AP, led to the publication of new recommendations by the working party of the British Society for Antimicrobial Chemotherapy (BSAC) and AHA in 2006 and 2007 respectively.[2,3] The new guidelines recommended that fewer people needed to receive antibiotics as prophylaxis against IE before undergoing dental procedures. The guidelines were subject to conflicting interpretation among healthcare providers about patient eligibility for prophylaxis. Moreover, the results of recent surveys among dental practitioners showed that there is a trend toward overprescription. The lack of clear guidelines was recognised as a possible reason for this trend.[4,5]

The National Institute for Health and Clinical Excellence (NICE) in the UK was asked to remove the ambiguities about AP for prevention of IE by the Department of

Health (2007) and to provide a clear guideline based on the best available evidence. NICE published their definitive recommendations in March 2008 and brought to an end antimicrobial prophylaxis for patients who were considered at risk of IE after dental procedures.[6] BSAC[7] and the British Cardiovascular Society (BCS)[8] also endorsed the new NICE guidance and it was incorporated in the new edition of the *British National Formulary* in March 2008 (BNF 55).[9]

The new guideline proposes a substantive change and fundamental departure from previous practice in AP that challenges long-standing beliefs and changes long-established practice patterns.[10] It may pose difficulties for practitioners who have previously prescribed AP, but now need to convince their patients that there is no longer a need.[11]

Although guidelines exist, at the practice level there are a variety of factors that may influence successful guideline implementation. A recent study reported that the majority of healthcare professionals expressed concern at no longer providing AP, with two thirds of general dental practitioners suggesting they would not stop AP without confirmation from a cardiologist. Similarly, 80% of the patients wanted confirmation from the cardiologist before implementing the NICE guidance; and a further 10% were unhappy with the guidance regardless of the views of their healthcare professionals. This study did not explore in depth what underpins these attitudes.[12]

Identifying potential barriers that may affect clinicians' ability to apply new guidelines to their clinical practice is essential to facilitate the implementation of evidence-based guidelines.[13,14] Interventions that target the barriers to change have been found to have a greater impact on changing clinical practice.[15] This study aimed to determine professionals' views on the new NICE guideline and investigate barriers and facilitators to the implementation of the guidance in clinical practice. A secondary aim was to generate ideas on ways of overcoming the identified barriers.

METHOD

A qualitative study consisting of semi-structured interviews was conducted to explore practitioners' personal experiences, ideas and opinions about the implementation of the NICE guidelines. Qualitative methods were chosen as the aim was to understand perspectives, motivations and frames of reference and generate new ways of perceiving or understanding a social phenomenon.[16] Of particular relevance of this research, where the impact on patients of a change in clinical practice is being recommended, is the ability of qualitative methods to provide a rich level of data to map a phenomenon or its features. Approval for the study was received from the Research Ethics Committee of King's College Hospital, London, UK (Ref No: 08/H0808/126).

Cardiologists and dentists were recruited to participate in the study as they are central to the implementation process for the NICE guidelines. Invitation letters and information sheets were sent to 40 dentists practising in King's College London Dental Institute and 16 cardiologists working at Guy's & St Thomas' Hospital NHS Foundation Trust. In general, qualitative research does not seek to quantify data. Qualitative sampling strategies do not aim to identify a statistically representative set of respondents, so expressing results in relative frequencies may be misleading. In most qualitative analyses the data are preserved in their textual form and 'indexed' to generate or develop analytical categories and theoretical explanations.[17]

The sample was selected from 15 dentists and two cardiologists who responded positively to the invitation. However, at the point of data saturation, where no further or new data being generated, the recruitment of dentists was stopped at seven. Those recruited into the study at the saturation point included nine clinicians (seven dentists and two cardiologists) and one clinical nurse. The sample was chosen to reflect variation in gender and professional experience. Those who agreed to take part in the study were asked to sign a consent form. A mutually agreed time was set for the interview to take place. Semi-structured interviews were conducted using a topic guide to ensure coverage of key areas while allowing flexibility to follow up issues arising out of the interviews in more detail. Interviews lasted between 30 to 50 minutes and were recorded and transcribed verbatim before analysis.

Analysis

The transcripts were analysed using the framework approach, whereby analytical categories are derived deductively as a way of approaching the data. The framework methodology consists of five stages which involve: familiarisation; identifying a thematic framework; indexing; charting; and mapping and interpretation.[17,18] This method is particularly suitable for applied or policy relevant qualitative research. Following the stages in framework approach, an initial thematic framework was developed which reflected prior issues and questions derived from the objectives of the study, as well as issues raised by respondent themselves through the familiarisation process. The thematic framework was checked repeatedly against the interviews and a distinct framework comprising a series of main themes subdivided by a succession of related subtopics was identified. The transcribed interviews were indexed with codes linked to the thematic framework independently by members of the research team and the coded texts were compared. During the 'charting and mapping' stages, each main theme and its dimensions were refined and displayed in an individual matrix, where every respondent was allocated a row and each column denoted a separate subtopic. Data from each participant were then linked to the appropriate parts of the thematic framework. Appendix 1 presents a small example of one of the main themes and related matrix. In the final stage of analysis the data were investigated to find associations between themes and provide explanations for the findings.

RESULTS

Attitudes to the NICE guideline

The sample profile is presented in Table 1.

The implementation of the new guidelines was seen to affect clinical care directly. It also raised practical issues about how advice should be given and the implications of giving changing or conflicting advice. A range of issues around opportunities for research and assessing the evidence base were also raised. Practitioners reported a range of positive and negative views about the NICE guidelines, with positive views reflecting acceptance of the change and promoting adherence, while

negative attitudes and beliefs stemmed from doubts about the successful implementation of the new guidelines in clinical practice. A summary of the key themes is presented in Table 2. Views on the guidelines are presented first. These are followed by practical suggestions on how perceived barriers to implementation may be overcome.

The impact of the NICE guidelines on clinical care

Respondents suggested that the majority of patients accepted the change in guidelines and were willing to follow and trust the advice of their doctors and dentists, particularly if explicitly given. It was suggested further that many patients were relieved not to have to take extra medication.

'I have been quite surprised that most people have been happy about the change, because of trust.' (Dentist, female, coded PP1)

There were, however, a small number of patients who had been categorised as high risk under the previous guidelines and who were highlighted as a cause for concern. The respondents noted that it could be difficult to persuade patients who had previously had an IE that they did not need AP, and that this was a particular issue for patients who believed dental treatment was the main cause of their infection and had been given AP to prevent recurrent IE.

'All the patients who told me so far that they want to continue with endocarditis prophylaxis are the ones who either had a personal experience of endocarditis or somebody near to them in the family with the similar condition getting endocarditis.' (Cardiologist, male, coded NP1)

The cardiac nurse also reported cases of patients who expressed worries about the new guideline.

'For lots of our patients I think they were all quite shocked when they were told in the clinic and I think they have seen the antibiotic cover – that they have to take about an hour before – as a sort of safety measure. Because I think they have seen that as sort of a safety net really for them.' (Cardiac nurse, coded NP1)

This tricky situation was then exacerbated by inconsistency of message from the professionals. Some participants noted situations where cardiologists were recommending AP counter to the new guideline. In these cases the patients tended to accept the cardiologist views above those of the dentist even where the dentist was following the guideline. While this put the dentist in a potentially difficult situation, empathy for the patients was expressed.

'I would be more empathetic with those affected with endocarditis because if I had been in hospital for months on IV antibiotics and believed it was dental treatment that had caused it, then what I would do is to take antibiotics myself and not tell the dentist.' (Dentist, female, coded NP2)

Inconsistency can also affect credibility and trust between the clinician and the patient. Dental practitioners found themselves in situations where they had to go back on advice they had previously given to patients.

'Interestingly enough I have a number of patients who have refused to take

Table 1 Demographic profile of nine interviewed clinicians and a cardiac nurse

Participant	Gender	Speciality	Medical condition
1	Male	Dentist	Sedation & Special Care Dentistry
2	Female	Dentist	Sedation & Special Care Dentistry
3	Female	Dentist	Community Dentistry
4	Female	Dentist	Sedation & Special Care Dentistry
5	Male	Dentist	Community Dentistry
6	Male	Dentist	Primary Dental Care
7	Male	Dentist	Primary Dental Care
8	Female	Cardiologist	Adult Congenital Heart Disease Clinic
9	Male	Cardiologist	Adult Congenital Heart Disease Clinic
10	Female	Cardiac nurse	Adult Congenital Heart Disease Clinic

Table 2 Practitioners' attitudes to implementation of NICE guideline on antibiotic prophylaxis

	Patients' clinical care	Practical issues for clinicians	Organisational issues around the guidelines and evidence
Positive issues	PP1 - Acceptance by the majority of the patients PP2 - Taking less medication PP3 - Moving to primary care	PC1 - Straightforward guideline that seems easy to adopt PC2 - More treatment options PC3 - Avoiding the antibiotic side effects PC4 - Avoiding unnecessary medication	PO1 - One rule for every body PO2 - Reducing variation in the delivery of care PO3 - Reducing the cost PO4 - Research opportunities
Negative issues	NP1 - Rejection by high risk patients NP2 - Receiving conflicting advices from health care team NP3 - Reduces credibility of dentist	NC1 - Conflict with training and beliefs NC2 - lack of confidence in available evidence NC3 - Different guidelines in other countries NC4 - Lack of consistency across professions NC5 - A challenge to professional autonomy NC6 - Confusion about unconsidered conditions	NO1 - Lack of consistency in message across time NO2 - Economic motivation NO3 - lack of confidence in NICE NO4 - Lack of continuity of the message internationally

PP: Positive points on the subject of patient care
NP: Negative points on the subject of patient care
PC: Positive points on the subject of practical issues for clinicians
NC: Negative points on the subject of practical issues for clinicians
PO: Positive points on the subject organisational issues
NO: Negative points on the subject organisational issues

antibiotics and we spent some time persuading them to take antibiotics. Now they feel justified by the guidance because they were right in what they thought. So, I don't think you can ever cover all situations.' (Dentist, female, coded NP3)

The importance of providing patients with a consistent message regarding their treatment was acknowledged and the need for the entire healthcare team to follow the same guidelines was stressed.

Practical issues

In general, practitioners found the new guidelines relatively straightforward and easy to adopt.

'Well, I was quite pleased at first because we got into an awful mess with antibiotic cover. So when the new guidance came out, it was very easy. Nobody needs antibiotic cover. It seemed a really good way of doing it.' (Dentist, female, coded PC1)

Fear of developing IE following dental practice had been a major concern over many years and had made dental practitioners responsible for ensuring antibiotic cover was taken by at-risk patients. The new guidance removed this responsibility and offered the possibility of treating all patients in the same way. Moreover, it removed dentists' concern about repeat visits and the number of treatments that could be offered to patients at each visit.

'We can actually manage these patients better. We can see them without antibiotic cover so we have no worries about hygiene treatment or seeing them frequently where we had to be careful in the past.' (Dentist, female, coded PC2)

It was felt that AP cover had been used too widely in the past and that the guideline prevented relatively low risk patients being exposed to AP drugs (with their associated and potentially fatal side effects), when the effectiveness of such antibiotic prophylaxis is unproven. The guideline was also seen to contribute to addressing the problem of overprescribing and to decrease concerns regarding the risk of antibiotic side effects (eg deaths through fatal anaphylaxis).

'The real risk is around side effects. I mean oral amoxicillin is very cheap. It is not really most expensive drug, but the main risk is bacterial resistance which is again debatable. Seems to be a bad risk of anaphylaxis, too.' (Dentist, male, coded PC3)

'It seemed a lot of patients were being covered just because of a vague history of having a cardiac problem.' (Dentist, male, no. 2, coded PC4)

In practical terms the new guideline was seen to make treatment more straightforward. There were, however, some reservations expressed in relation to the evidence base on which the guidelines were developed.

During their professional training the clinicians within this study learned that IE is a fatal disease with high mortality and morbidity rates and that dental treatment is a main cause for IE in at risk patients. They had also been taught that antibiotic prophylaxis is effective for the prevention of IE in at risk patients. This made it difficult for some of the respondents to trust the new NICE guidelines.

'Personally if I have had a family member who had infective endicarditis, I will still give the antibiotic cover. Because I am not convinced and I have no evidence for that.' (Dentist, male, coded NC1 & NC2)

'We were still getting referrals to special care for people needing antibiotic cover, maybe people didn't feel comfortable with it.' (Dentist, female, coded NC1)

There was an expressed lack of confidence in the quality of the guideline due to the lack of direct evidence to support the recommendations made. This makes it difficult for clinicians to give patients a clear and unambiguous message.

'I guess the problem in the end is that we don't really have enough evidence, especially for our patient group, to say for definite one way or the other. The evidence we have, which is mainly indirect evidence, and not good evidence, that there is a direct link. On the other hand we really don't have any direct evidence, that it doesn't prevent endocarditis.' (Cardiologist, male, coded NC2)

Slightly different guidelines published by other organisations such as AHA raised concerns about best practice and led to disagreement among the experts.

'There are recommendations coming from America which are different. So it is still a muddle.' (Dentist, male, coded NC3)

The issues raised in relation to clinical and practical difficulties led to reduced levels of adherence to the NICE guidelines, with clinicians, particularly cardiologists, expressing a preference for alternative guidelines such as those published by the AHA, the BCS or the BSAC. This can cause dissent among the healthcare team and makes it difficult for dentists to follow the NICE recommendations. In some cases dentists found themselves offering advice that diametrically opposed that offered by other members of the team. This creates a difficult working environment and can increase anxiety for patients.

On a practical level concerns were also raised about the impact of these guidelines on professional autonomy.

'I suppose a lot of people (professionals) are not happy about the way NICE goes about things. They seem to get a lot of guidance from NICE and it's not always presented in the professional most sympathetic way but almost imposed on us and people obviously don't like to be told what to do.' (Dentist, female, coded NC5)

There was also concern about the absence of reference to some high risk conditions[19] in the guidelines:

'There are a number of conditions for which antibiotic prophylaxis is still necessary which are not cardiac lesions. And that is perhaps not being made clear when you read the guideline.' (Dentist, male, coded NC6)

'The NICE guidelines specifically have not addressed the problems associated with other diseases. If you are immunosuppressed for any reason, what effect does that have on susceptibility to IE?' (Dentist, male, coded NC6)

Overall, the main practical concern stemmed from interprofessional disagreement about the guidelines and whether they should be adhered to.

Organisational issues and topics around the guideline and evidence

Benefits and drawbacks to the new guidelines were identified in relation to their

impact on the organisation of healthcare and in relation to the ideological and scientific basis for the guidelines. One proposed benefit of the new guidelines is that all patients should be treated in the same way. This, in theory, should reduce unwanted variation in the delivery of care caused by differences in opinion and advice. At a population level the guideline also carries the benefit of reducing the number of patients in need of specialist care. A whole group of patients can be automatically and legitimately discharged into primary care, reducing costs at an organisational level. This gives the patient more flexibility to select a dentist wherever they want and frees up time for specialist dental services. Ceasing AP also provides a unique research opportunity to assess and monitor prospectively any change in IE incidence and conduct randomised prospective studies. These benefits were welcomed by the respondents in the study.

A number of concerns were raised, however, in relation to the scientific and ideological basis for the guidelines. Respondents highlighted the lack of strong evidence to support the decision made by the guideline developers, alongside contradictory advice presented by other guidelines. One participant questioned the credibility of the way NICE guidelines were produced.

'NICE are doing too many things and maybe not well enough. In the last month NICE made a mistake, so the general perception by public, of NICE, has reduced.' (Dentist, male, coded NO3)

Changes in recommendations over the past few years created scepticism and negatively influenced implementation. It was therefore difficult for the practitioners to believe that the NICE guideline would offer best practice to patients.

'The fact is that there is no evidence that antibiotic cover was required for patients with certain cardiac conditions when they were having specific items of dental treatment. But the problem was that over the years the guidelines changed quite a lot. It's never been absolutely said, to everybody, there are fixed guidelines and there have been guidelines from this country, there have been guidelines from America and sometimes we have had conflicting guidelines in this country about what we should do. So, neither staff, students, nor the patients have really been in the position where they have perhaps had the confidence on what's going on regarding the use of antibiotic cover.' (Dentist, Male, NO1)

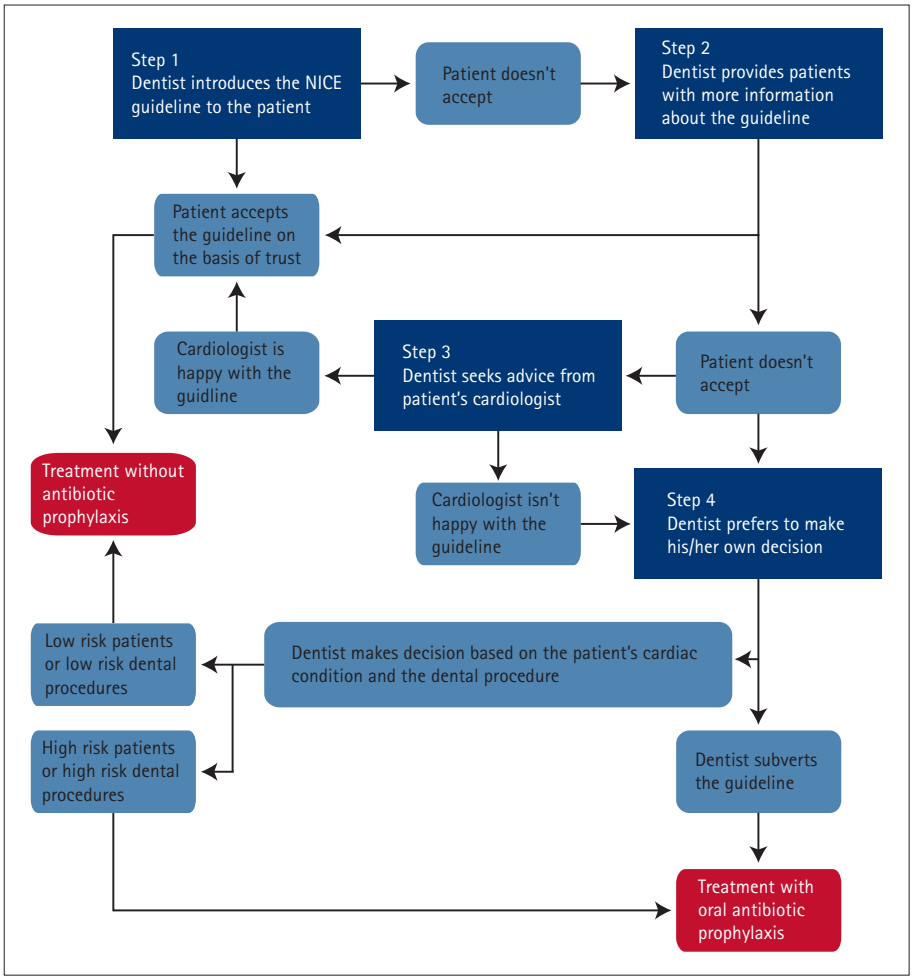

Fig. 1 Steps dentists follow in decision making process for adoption of the new guideline

One participant suggested that the use of antibiotic cover for patients with cardiac conditions was based partly on defensive medico-legal principles rather than on science. So, the position is unclear and clinicians have used AP both to protect the patients from potential risks and to protect themselves.

Concerns were also raised about the ideological basis for the guidelines. Some dentists expressed the concern that cost control and economic motives may lie behind the development of the guideline. NICE was viewed by some as being more about cost effectiveness than quality of care and there was a suspicion that one of the tasks of the guideline was to decrease healthcare costs. This issue was highlighted in other studies exploring practitioners' attitudes to healthcare system changes, especially when new guidelines discouraged the use of particular interventions (prospective guidelines).[20,21]

'The trouble is with the guidelines produced by NICE, very often people perceive NICE to be all about clinical effectiveness, when one thing back to clinical effectiveness it means that the treatment usually provided should be cost-effective. In other words, there is a monetary value to it. So the trouble is with NICE, when people see NICE with a monetary valuing on it say: I am not worth saving.' (Dentist, male, NO2)

The results from this study suggest that the new NICE guidelines were greeted with confusion, disagreement and suspicion by some but welcomed by others.

Reaching a decision

None of the practitioners interviewed had a completely positive attitude to the NICE guidelines. Most were, however, keen to adopt the guidance in their practice as far as practically possible. They made a range of suggestions as to how barriers to implementation at the patient, clinician

and organisation levels could be overcome. Patients' needs and concerns were central, and the decision process followed with regard to individual patients is presented in Figure 1.

Strategies employed in implementing the guideline

It was widely felt that the most effective way of getting patients to agree to treatment without AP is through clinicians' direct advice.

'I suppose patients like to know and want to hear from a source that they trust. They might believe something that they read in the newspaper or if they get a letter from an organisation, saying you don't need AB cover, but I think they still need to confirm it with the trusted source.' (Dentist, male)

It was recognised that the changes were confusing and that some patients did not understand how they could change overnight. Talking to the patients and providing more information were recommended to improve patients' knowledge and understanding about the policy. It was suggested that information for the patients needs to be accessible and be provided in simple language and preferably in written format so that patient can take it away.

'We give a very strong message about dental care and dental hygiene so the way we are putting it across to patients is: you may be aware that there has been a change in the advice. A panel of experts have looked at all the evidence and decided that it is good dental care that makes a difference and not having AB if you go to the dentist.' (Cardiologist, female)

A minority of patients (particularly those with an experience of IE) were perceived as being more resistant to changes in practice. The strategy identified to deal with these patients on a one-to-one basis was to supply patients with accurate information on the guidelines. However, clinicians found it difficult to persuade them simply by providing more information. They suggested more time and flexibility would be needed for these patients. By being flexible and respecting the patient's view, practitioners might ignore the guideline and give them prophylaxis anyway, or they may offer them an alternative using oral AP to reduce the risk of anaphylactic reactions. Understanding patients' anxiety influenced clinicians' decision making.

'Those previously infected with endocarditis, I would be more sympathetic and probably if they were insistent and they need an extraction I would probably go along with what the patient wanted for that particular treatment. But if it was just to have a filling done or a little bit of scaling then I would probably talk them out of it a bit more strongly. So I would weigh it up.' (Dentist, female)

Seeking advice from the patient's cardiologist was another strategy suggested. In many cases this resulted in a mutually agreed programme of action. In some cases, however, where professional views differed, applying the cardiologist's advice allowed dentists to cover themselves:

'If the cardiologist had written back that you must continue with the AB cover, as long as I had documented that letter in my notes, I would be happy to continue with AB cover on his advice.' (Dentist, male)

Overall, healthcare professionals tended to apply flexibility in their decision making based on individual cases. This is in contrast to the guidelines which seek to apply one standard to all. The guidelines are not viewed as being flexible or taking into account patients' feelings, beliefs or wishes.

'What I try to do is to take one instant at the time, because you can't persuade all of them in the same way. You have to understand what their anxiety is, if you can help them to overcome that anxiety. But I haven't got a formula.' (Dentist, female)

Some participants suggested that another cycle by NICE is needed to take into account the issues which have already been raised in clinical practice and modify the guidance or ensure that the new guideline is the best practice. Making more efforts to improve the quality of the information disseminated, especially for the patients, has been recommended as well. More research is needed to provide relevant evidence to back up the guideline and convince health professionals to implement it.

DISCUSSION

Barriers to evidence-based practice and guideline implementation are variously ascribed to practitioner, patient, organisational and guideline factors,[20–22] although practitioners appear to be the key factor.[21] They have a critical role in translating recommendations into improved outcomes. Earlier studies showed that a physician's ability to execute recommendations could be affected by external and internal factors which influence physician knowledge and attitudes to a guideline.[23] Studies on implementation of guidelines have revealed that doctors' own attitudes to guidelines are often transmitted to the doctor-patient relationship and seem to be reflected in patients' attitudes. This would clearly have an effect on patients' choices.[21]

In this study, we explored common barriers for implementation of the new guidelines on AP among two groups of professionals who are primarily affected. In contrast to many guidelines, considered to be difficult because of the complex format, participants in this study were more likely to describe the NICE guideline as easy to understand. Concerns were expressed as to the appropriateness of the guidelines in all cases, however, particularly for those with the highest risk. Factors identified in this study as barriers influencing dentists' adherence to the NICE guideline reflect the potential barriers to change found in the medical literature. A systematic review of qualitative research on general practitioners' (GPs') attitudes to and experiences of clinical practice guidelines identified common attitudinal barriers.[20] The factors identified in our study were comparable to the results of this systematic review. Questioning guidelines and being sceptical about the evidence base has been recognised as a barrier to change among GPs. Indeed, most participants in our study argued with and questioned the evidence on which the NICE guideline was developed. Earlier studies have also indicated that changing recommendations and disagreement about evidence could result in negative attitudes among health professionals.[24] By considering the nature of guidelines, many studies on prospective guidelines have identified that preserving the doctor-patient relationship and professional responsibility are two common themes linked to the successful implementation of a guideline in practice. Economic concerns along with defensive practice were identified as an answer to

why practitioners may not follow guidelines, despite the fact that guideline adherence could protect them in a possible legal process.[20] Professional responsibility to prevent IE in high risk patients was seen as an obstacle to compliance, especially by cardiologists.

Conflicting advice from cardiologists clearly influenced dentists' ability to implement the guideline. Whereas 75% of cardiologists surveyed in Ireland were content for dental practitioners to implement this guideline without consulting them,[12] the lack of interest by a large number of cardiologists to participate in our study may indicate their negative views of the NICE guideline. Although uncommon, individual patients' requests were a strong barrier to change. The British Cardiac Society (BCS)[8] and Dental Protection (DP),[25] considering concerns that this change will raise for their members, issued two separate statements to help them in the decision making process. BSC advised its members 'not to feel under undue pressure to change their practice and that patients who wished to continue with antibiotic prophylaxis should be allowed to do so. Indeed, in the absence of definitive evidence, the Society views this issue as "a matter of conscience" and will support any member who chooses to recommend AP in selected circumstances'. On the other hand, DP asked dentists working within an NHS contract to observe the guidance of NICE when writing prescriptions. Clinicians working privately may not have a contractual obligation to follow this guidance, but they would need a very strong justification for choosing not to do so. According to the DP statement, following a cardiologist's opinion when it clearly conflicts with guidelines issued by an authoritative body – even if it has been confirmed in writing – is inadvisable and may be difficult to defend.

When reaching a final decision on implementing the NICE guideline in clinical practice, this study showed that it was impossible to manage all patients with the same formula. The individual patient's wishes and requests, together with scepticism about applying generalised research findings to individuals, was the most important argument among participants. Guidelines can be viewed as providing clinicians with 'fixed' rules for practice in a particular population while in clinical practice, professionals feel a responsibility to take into account individual patients' needs and requests and adapt the guideline to suit circumstances. As such, a 'guideline' should include 'in-built' flexibility to allow clinical adaptability. Guidelines produced by committees of high-profile bodies and organisations can often be viewed as 'protocols', ie a set of standards that must be complied with. But a guideline is simply just that: a set of recommendations to guide clinicians in the many and varied decision making circumstances they are faced with.

Given the lack of strong evidence to support decision making, CPGs provided by a group of experts based on the best available evidence can be effective tools to guide professionals in decision making. The use of this information as the basis of decision making could be an example of good medical practice. However, the potential gap between research evidence and individual patient circumstance can create dilemmas in clinical practice.

Effective communication between patients and physicians, considering each patient's unique personal concerns and attitudes, has been recognised as an essential tool for adopting research evidence changes.[26] This is exactly what is defined as evidence-based practice (EBP). It not only provides health professionals with the opportunity to achieve good communication with patients, it also helps them to cope with the dilemmas of applying the evidence to individual patients.

This qualitative study is limited by the lack or generalisability of the findings to other cohorts of practitioners. Generalisability was not, however, the aim of the study. Rather, it sought to chart experiences and opinions on the new guideline and its implementation. Most of the participants in this study are highly experienced and work in a centre of excellence, and as such represent a wealth of experience in treating potentially high risk patients. However, the findings of this study and other similar studies addressed clinician's concerns and could be useful for guideline development and implementation of programs in the future.

CONCLUSION

While the new NICE guideline on AP has been widely disseminated and practitioners have been informed about the change, confusion regarding different guidelines and variable opinions by experts has resulted in sceptical attitudes among practitioners. It was generally felt that the NICE guideline did not apply to all individual cases and a 'blanket' approach was too simplistic. There is a feeling that the blanket guideline attacks dentists' clinical autonomy; and that cardiologists' conflicting views and patients' resistance make it more difficult for dentists to implement the changes. Dentists need to be able to make case-by-case individual analyses and treat each patient in the way that they feel is most beneficial to that particular patient. The guideline does not provide this flexibility and it seems to be too rigid for easy implementation. Standards of good care could be achieved by matching the result of research evidence to the unique individual patient circumstances. Further studies could assess effective guideline implementation strategies at both the physician and patients levels.

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Appendix 1 Thematic chart of a sample of framework analysis method related to dentists' positive views about the NICE guideline

Dentists' positive views about NICE			
Personal details	**P1: One rule for everybody**	**P2: Large group of patients are ok about it**	**P3: A lot of patients go from secondary care back into primary care**
D1: Male Sedation and Special Care Dentistry	D1: The new NICE guideline came out, everybody initially rejoiced and was pleased because it was one rule for everybody (Line 56).		
D2: Female Sedation and Special Care Dentistry	D2: Well I was quite pleased at first because we got into an awful mess with antibiotic cover. So the new guidance came out, very easy, nobody needs antibiotic cover. It seemed a really good way of doing it (Line 49, 74).	D2: We were given a leaflet, we did print off a number of copies, I'm not sure we had given that many out to patients. So I haven't heard people having a particular problem within here, and the students will grow up not knowing antibiotic cover, so as younger dentists come through it's going to be things that happened in the past. But I haven't heard other people having problems with it (Line 90, 124, 128).	D2: A lot of patients could move from secondary care back into primary care so I thought that was going to be good as well (Line 297).
D3: Female Community Dentistry		D3: Actually, we have not had any complaints. They haven't been upset. I think we have persuaded them, we have told them about the guideline and this is the way that things have done now (Line 25).	

D: Dentist interviewed, P: Positive view