Factors influencing dental practitioner performance: a literature review

March 2011

1st edition
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This review

In order to continue to develop its role in supporting healthcare organisations to address the performance concerns relating to dental practitioners, NCAS requires an in-depth appreciation of the factors that have the potential to influence clinician performance. It has therefore commissioned this literature review. This review will contribute to the development of the NCAS dental service, as well as ensuring a robust evidence-based foundation for concurrent research programmes.

The aims of the review were to:

- create an evidence-based document of the factors that impact upon dentist performance
- identify gaps in the literature and suggest areas for further research.

The specific questions the review attempted to answer included the following:

- What are the factors that influence a dentist’s performance?
- Why do these factors arise?
- How do these factors impact upon performance?
- What interventions exist, and are they effective?
- What are the areas for further research?
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Executive Summary

Setting the context
There are an increasing number of factors that have the potential to influence the performance of a dental practitioner. They include the gender ratio, ethnicity and skill-mix of the dental workforce. Most dental schools are now accepting more females than males and there are increasing numbers of dentists from the European Union (EU) and overseas working in the United Kingdom (UK). Other factors include health, changing working patterns, the environment and workload.

It is important to understand what is meant by “performance concerns”. The National Clinical Assessment Service (NCAS 2010) defines the term as any aspects of a practitioner’s performance or conduct which:

- pose a threat or potential threat to patient safety
- expose services to financial or other substantial risk
- undermine the reputation or efficiency of services in some significant way
- are outside acceptable practice guidelines and standards.

Aims of the review
In order to continue to develop its role in supporting healthcare organisations to address the performance concerns relating to dental practitioners, NCAS requires an in-depth appreciation of the factors that have the potential to influence clinician performance. It has therefore commissioned this literature review. For the purposes of the review, the terms “dentist” or “clinician” include dental practitioners working in a variety of clinical settings, although as the majority of dentists in the UK work in general dental practice, the review focuses primarily on this group. It will contribute to the development of the NCAS dental service, as well as ensuring a robust evidence-based foundation for concurrent research programmes.

The aims of the review were to:

- create an evidence-based document of the factors that impact upon dentist performance
- identify gaps in the literature and suggest areas for further research.

The specific questions the review attempted to answer included the following:

- What are the factors that influence a dentist’s performance?
- Why do these factors arise?
- How do these factors impact upon performance?
- What interventions exist, and are they effective?
- What are the areas for further research?

Methodology
In keeping with the scope of this review, the literature search was primarily focused on UK-based studies. However, when gaps in the UK-based evidence were identified, attempts were made to source information from studies based outside the UK.

Relevant studies were identified using PubMed up to 30 June 2010 and from references cited in the papers obtained from this database.

Twenty two stakeholders from 12 organisations including regulatory bodies, counselling associations, dental indemnity insurance providers and other groups were contacted by e-mail. A dental public health subject matter expert, Dr Jos van den Heuvel, from the Netherlands was also consulted.

The impact of the following factors on dental practitioner performance was examined:

- A consideration of demographic factors
- The impact of health on performance
- Stress, burnout and other workplace-related illnesses in dentistry
- Smoking and the misuse of drugs and alcohol in dentistry
- Are psychological factors related to performance?
- The role of education and training
- The impact of work-related factors upon performance
- Leadership in NHS dentistry.

Results

This review provides a comprehensive summary of work already undertaken in dentistry, or in similar fields such as medicine, as well as identifying any additional contributing factors. Alongside this, a number of areas for further research in a variety of domains has also been identified.

The review is fully reflective of both current and future trends and incorporates information from the UK as well as countries such as the United States of America (USA) and European Economic Area (EEA) member states. It brings together information from a wide range of sources and considers the findings from published primary studies, previous reviews, policy statements, grey literature and the opinions of a wide range of experts.

Where gaps existed in the literature for dentistry, the review examined relevant studies in medicine and sought to make appropriate cross references and applicable conclusions. Such evidence was considered a robust foundation for the current review, providing both useful insight in unexplored areas, whilst also highlighting areas for further research in dentistry.

The table below provides a summary of the factors which are found to affect practitioner performance, and a description of the impact that this factor may have.

<table>
<thead>
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<th>Contributing Factor</th>
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| The proportion of female general dental practitioners (GDPs) is steadily growing in the UK, USA and Europe. | - Female dentists may be more likely than male dentists to work part-time due to family commitments. This may have implications for the dentist in terms of productivity and workload. However, conversely, this could also mean a better work-life balance which could enhance clinical performance.  
- A study undertaken in 2001 stated that only half of female dentists had returned to dental practice after a career break. Furthermore, only four per cent had enrolled on the Keeping in Touch Scheme.  
- Female dentists spend less time in attendance at postgraduate courses than male dentists. This may be partly due to differences in working patterns.  
- Communication skills have been found to be more superior in women, which may lead to more effective interactions and relationships with patients.  
- Male and female dentists differ in their leadership style.  
- Findings from NCAS cases show that, as in medicine, women dentists are less likely to be referred than men, although this difference is less pronounced in dentistry than it is in medicine.  
- A study has demonstrated that significant
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<tr>
<td>Differences exist between male and female dentists in psychomotor performance and cognitive function (simple reaction time, choice reaction time, word recognition, immediate word recall, and delayed word recall).</td>
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<td>A larger proportion of students from minority ethnic backgrounds are entering dentistry.</td>
<td>- One small study demonstrated how the UK general public is most likely to choose a white male as their dentist, and that there was only limited evidence to suggest that individuals matched their choice of dentist to their own ethnicity.</td>
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<td>The number of dentists originating from EEA member states and from overseas, and working in the UK, has also increased significantly.</td>
<td>- Due to the significant variations across EEA member states in the structure of the dental team and role of its members, non-UK trained dentists may react differently to other members of the dental team when compared to a UK trained dentist.</td>
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<td>Back pain, neck, shoulder and hand/wrist complaints are reported to be a particular problem for dentists.</td>
<td>- Dentists can sometimes experience such high levels of physical pain which can limit their ability to work.</td>
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<td>Infectious diseases are reported to be important health issues for dentists.</td>
<td>- The management of a hepatitis B infected dental clinician is relatively straightforward. However, the situation for the HIV infected dentist is less clear.</td>
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<td>Working with amalgam.</td>
<td>- There is no evidence to suggest any negative effects of amalgam on the health of dental professionals when amalgam separators and safe collection, handling and storage of waste are used.</td>
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<tr>
<td>Risk of developing cancer.</td>
<td>- There is little evidence to suggest any work-related increase in cancer risk among dentists, due to the risk of exposure to dental amalgam or ionising radiation.</td>
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<td>High levels of workplace stress, burnout and other &quot;work-related&quot; mental illness have been reported in dentists both in the UK and abroad.</td>
<td>- Clinical disorders such as burnout and depression may develop as a result of chronic long term occupational stress.</td>
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<td>- Dentists with a high burnout risk may report health complaints to a greater extent than dentists with a low burnout risk.</td>
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<td></td>
<td>- There is an emerging link between such factors and alcohol and/or drug misuse.</td>
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<td>- Dentists may be embarrassed by the thought of seeking professional help, due to the challenges of stigma and the dynamics of their professional role.</td>
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<td>It is reported that, as a profession, dentists show high rates of suicide providing some objective evidence of high levels of psychological distress.</td>
<td>Prevalence studies seem to demonstrate relatively high rates of alcohol and substance misuse amongst dentists, especially younger dentists, and dental students.</td>
</tr>
<tr>
<td>Health and well being studies have demonstrated that significant levels of alcohol consumption in general dental practitioners (GDPs) are often strongly correlated to feelings of stress.</td>
<td>There are potentially important ways in which personality and other individual characteristics can affect the performance of dentists.</td>
</tr>
<tr>
<td>It is reported that the culture of the profession may make dentists a vulnerable group for alcohol and substance abuse. Factors such as denial and stigma may impede early detection.</td>
<td>Emotional reactivity traits such as conscientiousness and agreeableness tend to be common in dentists. Dentists may also be more susceptible and reactive to stress than most people.</td>
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<tr>
<td>However, there is little evidence from the prevalence data to suggest that dentists were at a greater risk of developing alcohol or other drug use problems than the general population.</td>
<td>As demonstrated by the Myers-Briggs Type Indicator test, dentists can be described as realists who favour the practical and definite. Sensing and judging traits are also common in dentists’ personalities.</td>
</tr>
<tr>
<td>There are potentially important ways in which personality and other individual characteristics can affect the performance of dentists.</td>
<td>Dentists’ attitudes can impact upon their ability to complete a task to a pre-determined standard, both in a positive and negative sense.</td>
</tr>
<tr>
<td>Emotional reactivity traits such as conscientiousness and agreeableness tend to be common in dentists. Dentists may also be more susceptible and reactive to stress than most people.</td>
<td>Core values can have a significant impact upon performance, both as an individual dentist, and within the dental team. In particular, the way that individuals behave will vary according to the nature and strength of their basic core values.</td>
</tr>
<tr>
<td>As demonstrated by the Myers-Briggs Type Indicator test, dentists can be described as realists who favour the practical and definite. Sensing and judging traits are also common in dentists’ personalities.</td>
<td>High levels of work engagement are deemed to improve productivity and efficacy of the dental team.</td>
</tr>
<tr>
<td>Dentists’ attitudes can impact upon their ability to complete a task to a pre-determined standard, both in a positive and negative sense.</td>
<td>A person with a high level of job satisfaction may invariably hold positive attitudes towards their job, whilst a person who is dissatisfied may hold negative attitudes about their job. Job satisfaction is noted to determine productivity, staff turnover and absenteeism, and could also be related to stress and burnout.</td>
</tr>
<tr>
<td>Emotional reactivity traits such as conscientiousness and agreeableness tend to be common in dentists. Dentists may also be more susceptible and reactive to stress than most people.</td>
<td>Undergraduate education appears to have a fundamental role in the performance of future dental professionals.</td>
</tr>
<tr>
<td>As demonstrated by the Myers-Briggs Type Indicator test, dentists can be described as realists who favour the practical and definite. Sensing and judging traits are also common in dentists’ personalities.</td>
<td>Particular subjects may form a vital part of undergraduate education. These include leadership and communication skills, as well as understanding the role of and working with</td>
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<td>Vocational and dental foundation training schemes may play a vital role in the</td>
<td>Vocational and dental foundation training schemes may play a vital role in the development of the dental graduate, immediately post qualification. Dental foundation training programmes, in particular, provide trainees with a wider range of opportunities to develop their communication, team working and clinical and management skills, when compared to stand alone posts in each service.</td>
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<td>development of the dental graduate, immediately post qualification.</td>
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<td>Lifelong learning, continuing professional development and the availability of</td>
<td>▪ For dentists, the ability to expand and develop their careers is considered very important. This is both in terms of long term job satisfaction, and in the prevention of burnout.</td>
</tr>
<tr>
<td>postgraduate qualifications appear to be very important in enhancing and updating</td>
<td>▪ However, it appears that dentists who have been qualified the longest may be less likely to read professional journals.</td>
</tr>
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<td>the professional skills of practising dentists.</td>
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<tr>
<td>It is suggested that only a small proportion of dental practitioners attend retraining courses after a career break.</td>
<td>▪ A further concern was that those who did return to dentistry following a career break, were unlikely to have undertaken any form of retraining. This may impact upon the quality of care delivered, but it is difficult to ascertain to what extent.</td>
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<tr>
<td>In dentistry, the quality of clinical performance is strongly related to the ability</td>
<td>▪ This may be the ability to deliver different treatments due to changing oral health needs, to undertaking new governance procedures in line with emerging regulations, or to continued learning and self-development. An inability to undertake such tasks and respond to change may result in poor performance.</td>
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<td>to respond to change.</td>
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<td>Contractual arrangements (April 2006) – implemented in the NHS in England and Wales.</td>
<td>▪ Studies have revealed that levels of job satisfaction amongst GDPs have reduced since the introduction of the new contract. The main concerns appeared to focus on a lack of financial incentive to undertake preventive dentistry and the feeling of working on a “treadmill”. Primary Care Trusts (PCTs) were perceived to be placing pressure on GDPs to perform, by setting unrealistic activity targets and applying UDAs too rigidly, with the concept of “clawback” being a particular problem. The growing bureaucracy in the provision of NHS dental services has also been viewed as a particular problem.</td>
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<td></td>
<td>▪ There is no evidence to suggest a likely association between the 2006 contractual changes and poor clinical performance. However, it is clear that the above issues could inevitably impact upon job satisfaction and the quality of clinical work undertaken,</td>
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<td><strong>Organisational culture constitutes a range of social contextual factors which can profoundly influence the performance of those who work within the organisation.</strong></td>
<td>▪ There is no direct evidence to demonstrate a relationship between culture and the performance of a doctor or dentist.</td>
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<td>▪ However, given what is understood about the associations between culture and behaviour, it seems reasonable to assume that there is a link.</td>
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<td><strong>Professional networks, both formal and informal were seen to have a major influence over the performance of dentists.</strong></td>
<td>▪ Dental practitioners who do not belong to any network, and are therefore professionally isolated, may lack support mechanisms which could compromise performance.</td>
</tr>
<tr>
<td><strong>The impact of clinical setting on the performance of a practitioner was identified as significant.</strong></td>
<td>▪ Studies revealed that NHS practitioners may feel restricted in their ability to deliver quality care, in different clinical settings. Wholly NHS practitioners in the General Dental Service (GDS) were most likely to feel restricted in providing quality care, and that dental practitioners working in a mixed GDS/private practice were least likely to feel restricted in providing quality care.</td>
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<tr>
<td>▪ Job satisfaction, another variable in stress and burnout, was also shown to vary according to clinical setting.</td>
<td></td>
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<tr>
<td><strong>The importance of team working in dentistry is fully acknowledged in the literature.</strong></td>
<td>▪ The deployment of the full range of skill-mix within a dental team offers advantages of increased productivity and efficiency, a reduced number of visits per patient, per course of treatment, and a more cost-effective service. Such advantages will indirectly impact upon the performance of a dentist, principally due to a reduced workload and the benefits of reduced stress and burnout from a more efficient work environment.</td>
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<tr>
<td>▪ The acceptance by dentists of the developing role of Dental Care Professionals (DCPs) is crucial in allowing this shift towards greater team work, to generate the associated benefits.</td>
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<tr>
<td><strong>Strong clinical leadership in NHS dentistry is paramount.</strong></td>
<td>▪ Key Health Select Committee and Department of Health documents produced subsequent to the 2006 contractual changes highlighted a lack of dental leadership at Strategic Health Authority (SHA) and PCT level as a strong causative factor of some of the challenges experienced.</td>
</tr>
<tr>
<td>▪ Developing the consultant as a leader of the Dental Public Health (DPH) team within wider talent management and leadership development plans will both ensure that</td>
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<tr>
<td>Health organisations maximise the potential of the DPH team, and enhance professional leadership and clinical engagement within dentistry.</td>
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- The individual dental practitioner can play a role in driving change and influencing policy, but this is not widely undertaken.  
- At a more local level, leadership within the dental team is vital. The productivity, level of satisfaction and clinical performance of the dental team is strongly influenced by the dentist.  
- Leadership and communication behaviours have been identified as highly significant in creating a real “team culture”. |

**Limitations of research into factors influencing dentists’ performance**

This was not a systematic review, so the intention was not to report on every study examining these questions. However, the search strategy outlined was designed to be comprehensive and to allow for the selection of the most pertinent primary studies and relevant review papers.

A general observation applicable to many subject areas is that there is a lack of solid scientific evidence to demonstrate definitive associations or findings upon which robust conclusions can be based. The principal limitations of the research focused on the constraints of self-reported questionnaires and use of studies that are opinion or experience based, of which there are many. Generalisation can also be a problem in small studies which may not have obtained a representative sample. This is certainly the case in the UK, where there are few studies which are based in, or include, Northern Ireland or Scotland.

**Moving forward**

From the stakeholder engagement process it was found that there were significant volumes of informal data currently being simultaneously collated by individual organisations including the General Dental Council (GDC), Dental Complaints Service, NCAS, NHS Dental Services, Postgraduate Dental Deeaneries, Professional Indemnity Societies, etc. Pooling this information could help to generate an understanding of the magnitude of the problem and may also reveal the source of the problems, that is, understanding why dentists perform poorly and what can be done to remediate this?

These organisations are thus in a strong position to develop a portfolio of research on a variety of factors. Such studies will require an initial investment of research funds, but have the potential both to improve outcomes within the dental own workforce and to inform policy in other settings.

The findings from this work are applicable to the global community of dentists and could contribute to the ongoing research programmes of international organisations. It would also be extremely useful if future studies could be undertaken in partnership with such organisations.
References
Section 1: Introduction

Setting the context
Patterns of oral health are changing, with increasing inequalities, together with an ageing population, increased service uptake, new and increasing patient expectations, and an exponential growth in scientific and technological developments pertinent to oral health care. Thus there are increasing numbers of factors that have the potential to influence the performance of a dental practitioner. These issues include the gender ratio, ethnicity and skill-mix of the dental workforce. Most dental courses are now accepting more females than males and there are increasing numbers of dentists from the European Union (EU) and overseas working in the UK. Other factors include changing working patterns, the environment and workload. One such factor has arisen from the NHS General Dental Service contractual changes which took place in England and Wales in 2006. It has also been reported that dentists perceive their profession as being more stressful than other occupations (Cooper et al. 1987, Moore and Brodsgaard 2001). Stress is often associated with anxiety and depression, which can predispose to alcohol and drug abuse.

Purpose of review
In order to develop its role in supporting healthcare organisations to address the performance concerns of dental practitioners, NCAS requires an in-depth appreciation of the impacting factors that have the potential to influence clinician performance and has therefore commissioned this literature review. For the purposes of this review, the terms “dentist” or “clinician” include dental practitioners working in a variety of clinical settings, although as the majority of dentists in the UK work in general dental practice, the review focuses primarily on this group. It will contribute to the development of the NCAS dental service, as well as ensuring a robust evidence-based foundation for concurrent research programmes.

This will allow the organisation to advance in its capacity to prevent or identify potential problem areas and act swiftly to provide healthcare organisations and practitioners with the necessary support to ensure a high-quality and safe service for patients.

The findings from this work are applicable to the global community of dentists and could contribute to the ongoing research programmes of international organisations. It would also be extremely useful if future studies could be undertaken in partnership with such organisations.

The aims of this review are to:

- provide an evidence-based literature review of the factors that impact upon dentist performance
- identify gaps in the literature and suggest areas for further research.

The specific questions the review will attempt to answer include:

- What are the factors that influence a dentist’s performance?
- Why do these factors arise?
- How do these factors impact upon performance?
- What interventions exist, and are these effective?
- What are the areas for further research?

Scope of the review
This review provides a comprehensive summary of work already undertaken in dentistry, or in similar fields such as medicine, as well as identifying any additional contributing factors. The review is fully reflective of both current and future trends and incorporates information from the UK, as well as countries such as the USA and EEA member states.
The review brings together information from a wide range of sources and considers the findings from published primary studies, previous reviews, policy statements, grey literature and the opinions of a wide range of experts.

The impact of the following factors on dental practitioner performance was examined:

- A consideration of demographic factors
- The impact of health on performance
- Stress, burnout and other workplace-related illnesses in dentistry
- Smoking, and the misuse of drugs and alcohol in dentistry
- Psychological factors related to performance
- The role of education and training
- The impact of work-related factors upon performance
- Leadership in NHS dentistry.
References
Section 2: Methodology

Literature search strategy
Relevant studies were identified using PubMed up to 30 June 2010 and from references cited in the papers obtained from this database.

In keeping with the scope of this review, the literature search was primarily focused on UK-based studies. However, when gaps in the UK-based evidence were identified, attempts were made to source information from studies based outside the UK.

Similarly, where gaps existed in the literature for dentistry, the review examined relevant studies in medicine and sought to make appropriate cross references and applicable conclusions. Such evidence was considered a robust foundation to the current review, providing both useful insight in unexplored areas, whilst also highlighting areas for further research in dentistry. However, the limitations of its use are also identified in the Discussion section.

A general observation applicable to many subject areas is that there is a lack of solid scientific evidence to definitively demonstrate associations or findings upon which robust conclusions can be based. The principal limitations of the research focus on the constraints of self-reported questionnaires and use of studies that are opinion or experience based, of which there are many. Generalisation can also be a problem in small studies which may not have obtained a representative sample. This is certainly the case in the UK, where there are few studies which are based in, or include, Northern Ireland or Scotland.

PubMed was interrogated using key search terms within each domain. Various titles to describe dental practitioners were used as a search term, for example, dentist, dental practitioner, general dental practitioner etc. When this generated an excess of papers, as was the case for ‘dentist’, the search was restricted by preceding the term with a key word, for example, ‘sick’, generating the search term ‘sick dentist’. This process was undertaken for each domain. The search terms used for each domain are listed at the beginning of each section and also listed in their entirety in Appendix A. Key authors within each area were also identified and their names used in author-specific searches.

This was not a systematic review, so the intention is not to report on every study examining these questions. However, the search strategy outlined was designed to be comprehensive and to allow for the selection of the most pertinent primary studies and relevant review papers. Compared to other types of health care professionals, for example, doctors, there was generally less literature.

Stakeholder engagement process
Twenty two stakeholders from 12 organisations including regulatory bodies, counselling associations, dental indemnity insurance providers and other groups were contacted by e-mail. A dental public health subject matter expert, Dr Jos van den Heuvel, from the Netherlands was also consulted. Where possible, an individual within each organisation was identified as the appropriate recipient for this request. The full list of organisations contacted as part of this process can be found at Appendix B. Each organisation was asked to provide data, publications or reports they felt to be relevant to any of the outlined domains.

The stakeholder engagement process identified a range of factors that could affect the clinical performance of dentists. In particular, it appeared that the main reasons for a dentist being referred to a support or regulatory organisation on the grounds of performance concerns related to factors such as demographics, specifically gender and ethnicity, impairment related to burnout, stress, or alcohol and/or drug misuse and poor communications skills. In addition, undergraduate and postgraduate education, recent policy changes and work environment were highlighted as key factors which could also impact upon performance.

Whilst these organisations seemed very aware of the factors that can impact upon performance, key issues seemed to arise in the collection of data and information about such factors. Firstly,
organisations were not always able to use information in a way that was useful to them. For example, for support organisations, or those that offer counselling services, the need to maintain confidentiality prevented the use of information from individual case studies being made available.

Furthermore, several organisations were simply not analysing and formalising the information collated from individual case studies, despite the high caseload. Thus, where data were available, they were not necessarily always accessible to the organisation or to the general public. The impact of these limitations is discussed in greater detail in Section 11.

Nevertheless, it was reassuring to note that a few organisations did express an interest in formalising and processing such data.
References

Section 3: A consideration of demographic factors

Search terms
The search terms used in this domain are listed in Table 2.

Table 2. Search terms used to investigate demographic factors

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<thead>
<tr>
<th>Domain</th>
<th>Search Terms Used</th>
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<tr>
<td>A consideration of demographic factors</td>
<td>Demographics, United Kingdom, Ethnicity, Gender, Female dentists, Performance of dentists, Dentist gender and performance, Dentist gender and poor performance, Dentist gender and disciplinary measures, Dentist gender and performance concerns, Dentist age and performance concerns, Dentist age and poor performance, Overseas dentists and performance concerns, Overseas dentists and poor performance, Dental profession, Communication skills, Culture, Statistics of dentists in the UK, Gender differences, Minority groups in dentistry, Afro-Caribbean students in dentistry, Black students /dentists</td>
</tr>
</tbody>
</table>

Introduction
In the last few decades there have been significant changes in the demographics of the UK dental workforce. These changes have included an increase in the number of women working as dentists (Newton et al. 2001, Murray 2002, Gorter et al. 2006, Cooper et al. 2006), as well as a larger proportion of students from minority ethnic backgrounds entering the profession (Connor et al. 2004, Gallagher et al. 2007, Gallagher et al. 2009). Furthermore, formal international and national recruitment exercises in England have resulted in an increase in the number of dentists originating from EEA member states and from overseas working in the UK (General Dental Council 2005, NHS Information Centre 2006, GDC registration statistics 2010).

This section gives an overview of the demographic changes occurring in the dental workforce in the UK and makes global comparisons where appropriate. Reasons for such changes are examined, as well as how factors such as gender, country of qualification, ethnicity and age can affect the performance of dentists, specifically in terms of clinical performance, the dentist-patient relationship, working patterns, relationships within the dental team and psychomotor performance. Finally, to put these findings into context, the age, gender and ethnicity of those dentists that are referred to NCAS with performance concerns, is examined. The section concludes with recommendations for further research.

Changes in the gender of the dental workforce
In the last few decades there has been a significant increase in the number of women working in traditionally, predominantly, male dominated professions. This is particularly true for dentistry, where the proportion of female general dental practitioners is steadily growing (Newton et al. 2001). In the Netherlands, the proportion of female general dental practitioners has increased from 18.4 per cent in 1996, to 23.3 per cent in 2003. In the USA, in 2001-02, 37.5 per cent of dental graduates were
female, whereas in the UK, it was 30 per cent in 2000. In Northern Ireland, currently 39 per cent of practising general dental practitioners are female. In 2006, it was estimated that at least 50 per cent of current dental students in the above mentioned countries were female, or that this percentage would be reached in the forthcoming years (Gorter et al. 2006).

The feminisation of the dental profession is a reality in the UK. In 2006, 55 per cent of the applicants to dental schools were women (Cooper et al. 2006), and by 2020 it is predicted that over 50 per cent of all practising dentists will be female (Murray 2002). According to the NHS Information Centre (2009) the number of female dentists has risen from 30 per cent in 2000 to 41.2 per cent in 2009 (Figure 1).

![Figure 1. NHS dentists by gender in the UK (percentage) (The NHS Information Centre)](image)

The literature describes many reasons why women choose dentistry as a professional career. Becoming a dentist means entry to a health profession which offers a combination of intellectual and practical skills, with remuneration that compares favourably with that of other professions. Dentistry also has the availability of part-time working which could fit in with raising a family. There is the opportunity to use a variety of interpersonal skills, encouraging team working and interaction with patients (Seward 2001).

**Understanding the impact of gender upon performance**

The demographic changes in the dental workforce appear to have had a significant impact on the performance of the dental workforce. Such factors may not necessarily be directly related to poor performance, but can impact upon other aspects of work. For example, working patterns can often differ in male and female dentists. A number of papers suggest that this is principally related to the challenges of raising children (Wilson et al. 1988, Seward 2001, Murray 2002). It has been suggested that relationships within the dental team may vary according to gender, due to the differences in the communication styles of female and male dentists (Gorter and Freeman 2005, Gorter et al. 2006). It has also been suggested that communication skills can impact upon the quality of clinical care delivered by the dentist (Newton et al. 2001). Communication skills are often found to be superior in women and this may lead to more effective interactions and relationships with patients (Firth-Corzens 2008). These factors are discussed in more detail below under the relevant headings.

**Differences between male and female dentists in working patterns**

There is evidence that in the UK, 50 per cent of women in dentistry work for no more than two days per week in the NHS and most women work either as associates in general dental practice, or in the community dental service (Murray 2002). Similarly, Wilson et al. (1988) reported that female dentists were more likely than male dentists to work part-time, and that the number of hours worked by women was significantly related to the number of dependent children in their families.

The results of the most recent review of the female dental workforce (Seward 2001), suggested that nearly half (49 per cent) of the women had returned to dental practice after a career break. However, their work patterns changed on their return to work, with 54 per cent working fewer hours per week. The most difficult reported problem for 52 per cent of women returning to work was the emotional difficulties associated with leaving young children, followed by arranging childcare, and a loss of confidence in clinical skills. Difficulties were also reported in dealing with the unexpected illness of
children, or the need to attend events at school. All these factors can generate stress, and therefore impact upon the performance of female dentists.

The 2001 report identified that it was essential that women keep in touch with dentistry to avoid loss of confidence when taking a career break and it was disappointing that only four per cent had enrolled on the Keeping in Touch Scheme (KITS), a scheme which is no longer available.

The scheme was originally designed to provide support for dentists taking a career break, to assist them in maintaining their lifelong learning commitment to the GDC, and ultimately to help them return to work (London Deanery 2010).

But since 2006, this centrally co-ordinated responsibility for the support of dentists on career break and those returning to clinical dentistry has been devolved to Strategic Health Authorities (SHAs) and Dental Deaneries.

The role of the Retaining and Returning Adviser (RRA) has changed to meet local needs. In some Deaneries, an RRA is available once a fortnight, to provide assistance with learning needs assessment, Personal Development Plans (PDPs) and Continuing Professional Development (CPD), and where appropriate structured learning programmes.

Del Aguila et al. (2005) suggested that gender was a statistically significant, but not substantial, variable in predicting dentist productivity. In a study of 2,212 dentists working in the Washington Dental Service, female dentists were found to have substantially smaller net incomes than their male colleagues for this reason. However, such results must be viewed with a degree of caution as it cannot be assumed that being less productive in clinical service delivery constitutes poor performance.

The gender of dentists and the impact upon the relationship with the dental team

There are significant differences in the communication styles of female and male dentists. Gorter et al. (2006) reported that male dentists tend to be more “businesslike” and female dentists more “friendly” in their communication with the dental team. Gorter and Freeman (2005) concluded that male dentists generally had an “easier” working relationship with their nurses. Irrespective of whether female dentists adopted a ‘friendly like’ or ‘businesslike’ strategy, dental nurses would neglect their instructions and/or react in a disruptive manner. Interestingly, male dentists felt that the basis for their female colleagues’ difficulties was a consequence of inconsistent working strategies employed by especially younger female dentists. Female dentists tended to be both ‘friendly like’ and ‘businesslike’ towards their assistant at different times, whereas male dentists tended to maintain a hierarchical management framework throughout.

Gender differences and the quality of clinical care

Female dentists are perceived by both male and female patients as being more caring (Newton et al. 2001). This may be for a variety of reasons, for example, communication skills are often found to be superior in women. This may lead to more effective interactions and relationships with patients, lessening the chance of complaints and litigation (Firth-Corzens 2008).

Changes in the ethnicity of the dental workforce

In the last decade, the ethnicity of the UK dental workforce has changed significantly, principally due to increasing numbers of students from minority ethnic backgrounds entering the profession. The dental profession in the UK has been particularly effective in attracting minority ethnic groups (Gallagher et al. 2007). The number of dentists qualified in the UK from minority ethnic groups is growing and by 2020 it is expected that more than half of the dentists registered with the GDC will belong to this group (Connor et al. 2004).

Gallagher et al. (2009) found that medicine and dentistry attract a lower number of white applicants compared to the other professions. Thus, of all the applicants to dentistry in 2006, over half were from minority ethnic groups (Figure 2). The majority of applicants of ethnic origin, were Asian (Indian) 23
per cent and Asian (Other) 22 per cent. In stark contrast, the percentage of black applicants in 2006 was only 2 per cent (Figure 2).

The reasons for such distinct differences are not clear. Interestingly, neither medicine nor dentistry appears to be attracting black candidates and this is particularly the case for dentistry (Gallagher et al. 2009).

Connor et al. (2004) found that aspirations and expectations of the value of, and benefits from, higher qualifications are more significant positive drivers for minority ethnic groups than for white students, especially most Asian groups. It was found that minority ethnic groups, especially Asians, are more motivated to be highly academically qualified because it adds value to and benefits their personal and professional futures.

More specifically, in the fourth National Survey of minority ethnic groups in the UK, Bedi and Gilthorpe (2000) found that most migrants entered the country without qualifications, but that there were significant variations. The Black-Caribbean, Pakistanis and Bangladeshis were poorly qualified, though more than a third of Indians and Chinese had a higher qualification. The authors suggested that this may in part explain the high proportion of Indian applicants applying to, and entering medical and dental schools, as young people whose parents have a higher qualification are more likely to apply to higher education institutions.

The need to attract more black students into dentistry has been identified in the USA and a range of initiatives including the establishment of mentoring programmes, dental education outreach programmes and student loan programmes have been advocated (Gallagher et al. 2009).

Recent concerns over workforce shortages in certain parts of the country have led to formal international and national recruitment exercises. Together with general workforce immigration trends, this resulted in more dentists from abroad joining the Dentists Register in 2005, than home students (GDC 2005). The number of dentists originating from other EEA member states and from overseas, already registered and working with the NHS in the UK, has increased significantly over the last decade. In 1997, the percentage of overseas dentists was 12.5 per cent compared to 21.3 per cent in 2006 (NHS Information Centre 2006). By December 2009, it had risen to 27 per cent (GDC registration statistics 2010) (Figure 3).
Understanding the impact of ethnicity upon performance

It is apparent from the literature that there is little evidence to suggest a direct link between ethnicity and clinical performance. However, indirect associations do exist which can impact upon performance. In terms of the dentist-patient relationship, it appears that ethnicity is an influential factor when choosing a dentist (Newton et al. 2001). Similarly relationships within the dental team can be affected by the lead clinician’s perception of the role of other members of the dental team and the use of team dentistry (Gorter 2005). This will vary according to country where the dentist has qualified and worked in, as demonstrated by Luciak-Donsberger and Eaton (2009) who described the wide variations within the EU/EEA in the availability of oral health care provided by dental hygienists. This section commences with an explanation of the numbers of overseas qualified dentists with performance concerns, followed by a discussion examining the impact of ethnicity upon performance.

Country of qualification and performance concerns

In a study analysing 209 cases brought before the Professional Conduct Committee of the GDC over a five year period (between 2003 and 2007), Singh et al. (2009) demonstrated that within this sample of registrants, 58.9 per cent (122 dentists) graduated in the UK, followed by South African and Swedish graduates who comprised 11 per cent (23 dentists) and 9.1 per cent (19 dentists) of sampled registrants respectively. Only very low numbers of dentists graduating from other countries featured on this list: Germany (eight dentists); Denmark, Ireland, Italy, New Zealand (four dentists); Australia (three dentists); Belgium, France, Poland (two dentists); Holland, Hungary, Norway (one dentist). This information thus needs careful interpretation, as it was not possible to obtain an accurate percentage of charged individuals related to the total registered dentists for each country. Furthermore, the numbers of dentists originating from some countries is extremely low, and it is thus not possible to draw any robust conclusions about an individual country from registrant numbers as low as one or two. What this study does highlight however, is that further work is required to investigate the impact of country of qualification upon performance. This is discussed in greater detail in Section 8.

Ethnicity and the dentist-patient relationship

Newton et al. (2001), in a study involving 126 individuals from different ethnicities, concluded that the general public are most likely to choose a white male as their dentist. Furthermore, there was only limited evidence that individuals matched their choice of dentist to their own ethnicity. Additionally, perceptions of a dentist’s competence were not based on similarity of ethnic background.

Ethnicity and the impact upon the relationship with the dental team

There are relatively few studies exploring how race/ethnicity affects interactions between members of the dental team.

An examination of bullying in the workplace revealed that reassuringly, overall, there were no statistically significant differences in experience of bullying behaviours by gender or ethnicity in a group of 136 postgraduate hospital dentists in the UK (Steadman et al. 2009).

There is variation in the role of members of the dental team and the use of team dentistry across the EEA member states. In the Netherlands, for example, the concept of team dentistry is very well developed with all dentists working with full-time chair-side nursing assistance and numbers of dental hygienists and clinical dental technicians working in independent practice (Boom 2009). Whereas in Belgium, the concept of team dentistry is poorly developed, there are no dental hygienists, nor clinical dental technicians and only a minority of dentists work with a chair-side assistant. This difference in dental team structure is reinforced in the literature, by the results of a recent study, Luciak-Donsberger and Eaton (2009), which found wide variations within the EU/EEA in the availability of oral health care provided by dental hygienists. These differences may mean that dentists of non-UK origin may react differently to other members of the dental team, in comparison to a UK trained dentist.

Psychomotor performance, age and gender

Very few studies have investigated the direct impact of age and gender upon psychomotor performance and cognitive function, both key factors which could impact clinical performance. However, a cross sectional study of 180 dentists investigating the effect of chronic exposure to
mercury on health and cognitive functioning demonstrated that differences were found between the psychomotor performance of dentists and controls after adjusting for age and sex (Ritchie et al. 2002). Participants were assessed using a package of computerised psychomotor tests. The principal finding was that many differences existed in health and cognitive functioning between dentists and the control group, but these differences could not be directly attributed to their exposure to mercury. However, alongside this, the authors reported significant differences between male and female participants for simple reaction time, choice reaction time, word recognition, immediate word recall, and delayed word recall. Male participants demonstrated faster reaction times for simple reaction time and choice reaction time, and female participants demonstrated faster reaction time for word recognition and had higher word recognition scores for immediate word recall and delayed word recall. The authors also demonstrated an age-related difference in memory disturbance, where older dentists reported memory disturbance more often than younger dentists. These are all factors which could impact upon performance.

**Findings from NCAS Casework: The first eight years (NCAS, 2009)**

**Age and gender**

Amongst both men and women, the referral rate was found to be relatively low below age 35 and higher in the older age groups (Figure 4). It is also interesting to note that while concerns and referrals were generally found to be more common in older age groups, some dental assessments had been undertaken for dentists quite early in their careers. In addition, it was found that women dentists were less likely to be referred to NCAS than men. However, slightly more female dentists are referred to NCAS than female doctors.

**Figure 4. The age range of dental practitioners referred to NCAS from 2003 to 2009**

Furthermore, when comparing the distribution of GDP referrals and GDP workforce by age group and gender, it was found that the gender difference between referrals and workforce was statistically significant. Similarly, the proportion of GDP referrals aged under 45 (49 per cent +/- 6 per cent) was significantly lower than the proportion under 45 in the workforce (64 per cent +/- 1 per cent) if referrals with age unknown are assumed to have the same age distribution as practitioners with known age.
Ethnicity

The majority of dental referrals to NCAS were UK-qualified and white. Most assessed dentists had approximately matched this profile. Amongst assessed dentists who qualified outside the UK, place of qualification was normally within the EEA.

Similar to the findings from referred general medical practitioners, it was not possible in the analysis to examine whether referrals were coming proportionately from all ethnic groups without ethnicity monitoring of contractors. A comparison of dental and medical referrals showed different profiles, as would be expected from the historically different approaches to recruitment and registration of doctors and dentists from outside the UK. The ranges in brackets show the potential effect of missing data:

<table>
<thead>
<tr>
<th>Category</th>
<th>Dentists</th>
<th>Doctors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage qualifying in the UK</td>
<td>65% (51-73%)</td>
<td>50% (39-61%)</td>
</tr>
<tr>
<td>Percentage white</td>
<td>69% (50-77%)</td>
<td>48% (38-60%)</td>
</tr>
<tr>
<td>Percentage qualifying outside the UK and non-white</td>
<td>16% (11-32%)</td>
<td>41% (29-51%)</td>
</tr>
</tbody>
</table>

Associations with ethnicity and place of qualification need careful interpretation. In the hospital and community sectors, white practitioners qualifying in the UK are less likely to be referred or excluded or suspended than non-white practitioners qualifying outside the UK. There is no evidence that non-white UK-qualified practitioners are being referred or excluded disproportionately. The experiences of non-white UK-qualified practitioners are an important indicator of equity or lack of it.

Areas for future research

Suggested areas for further research focus on the impact of these demographic factors on aspects of clinical performance.

Firstly, it is vital to consider the impact of gender upon clinical performance. This is due to the differences in working patterns in males and females, especially given the low numbers of female dentists that return to clinical practice after a break. Research could be undertaken to investigate how to improve the employment opportunities of female dentists especially after a career break (Murray 2002). It is worth noting, however, as indicated in NCAS Casework: The first eight years (2009), women dentists were less likely to be referred to NCAS than men. There is thus a possibility that they actually perform better than their male counterparts. Perhaps the real issue is that more females manage a better work-life balance?

Regarding the relationship with members of the dental team, it appears that male and female dentists perceive their communication with their dental nurse (chair-side assistant) differently (Gorter and Freeman 2005). The authors suggest that further research needs to focus on this area, particularly given the increasing influx of young female dentists into the profession. In addition, a replication of the Gorter and Freeman (2005) study could focus on dental staff communication patterns, with the subjects being dental nurses. This would help to develop a greater understanding of staff communication in dentistry.

The literature revealed that in spite of the high numbers of members of ethnic minority groups applying to dental school, few black individuals applied. Further research could be undertaken to investigate what makes dentistry such an attractive career option for Asians and such an unattractive option for black applicants. The motivating factors for black applicants to dental schools could also be investigated.

Given that the number of dentists originating from EEA member states, and from overseas, has increased significantly in the last few years, further work could be undertaken to examine how dentists qualifying outside the UK should be supported in their clinical work, whilst working in the UK. The NHS must also improve the completeness of equality monitoring data to remove some of the
uncertainty around current findings. In addition, ethnic monitoring of primary care contractors may be required.

Very few studies have investigated the direct impact of age and gender upon psychomotor performance and cognitive function, both key factors which could impact clinical performance. This is important considering the findings of Richie et al. (2002) where significant differences were found between male and female participants in psychomotor performance and cognitive function. The authors also demonstrated an age-related difference in memory disturbance between older and younger practitioners.

Conclusion

- The proportion of female general dental practitioners is steadily growing in the UK, USA and Europe.
- Such changes may have had a significant impact on working patterns of the dental workforce, as female dentists may be more likely to work part-time than their male counterparts, and the number of hours worked by women is deemed as being significantly related to the number of dependent children in their families.
- Not all female dentists will return to dental practice after a career break, with the emotional difficulty often associated with leaving children and loss of confidence frequently cited.
- Significant differences in the communication styles of female and male dentists have been reported.
- Communication skills have been found to be superior in women, which may lead to more effective interactions and relationships with patients.
- In recent years, it has been found that a larger proportion of students from minority ethnic backgrounds are entering dentistry and the number of dentists originating from EEA member states and from overseas has also increased significantly.
- One small study demonstrated how the UK general public is most likely to choose a white male as their dentist, and that there was only limited evidence to suggest that individuals matched their choice of dentist to their own ethnicity.
- Due to the significant variations across EEA member states in the structure of the dental team and role of its members, dentists of non-UK origin may react differently to other members of the dental team than to a UK trained dentist.
- A study has demonstrated significant differences between male and female participants in psychomotor performance and cognitive function. The authors also demonstrated an age-related difference in memory disturbance between older and younger practitioners, where older dentists reported memory disturbance more often than younger dentists.
- Findings from NCAS cases show that, as in medicine, women dentists are less likely to be referred than men, although this difference is less pronounced in dentistry than it is in medicine. As in medicine, older dentists are more likely to be referred than younger dentists.
- Areas for future research includes investigating:
  - how best to support female dentists in returning to work after having children and managing childcare responsibilities
  - the different communication styles that exist between male and female dentists, particularly given the increasing influx of young female dentists into the profession
  - how practitioners qualifying outside the UK could be supported in their clinical work, whilst working in the UK
  - the impact of age and gender upon psychomotor performance and cognitive function.
References


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Gorter RC, Bleeker JC, Freeman R. Dental nurses on perceived gender differences in their dentist's communication and interaction style. Br Dent J. 2006; 201:159-64.


National Clinical Assessment Service. NCAS Casework: The first eight years. September 2009


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Section 4: The impact of health on performance

Search terms

The search terms used in this domain are listed in Table 3.

Table 3. Search terms used to investigate the impact of health on performance

<table>
<thead>
<tr>
<th>Domain</th>
<th>Search Terms Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>The impact of health on performance</td>
<td>Impairment</td>
</tr>
<tr>
<td></td>
<td>Sick</td>
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<td></td>
<td>General health</td>
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<td></td>
<td>Occupational health</td>
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<td></td>
<td>Physical disabilities</td>
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<td></td>
<td>Dentists with HIV</td>
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<td></td>
<td>Dentists with hepatitis B</td>
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<td></td>
<td>Dentists with hepatitis B</td>
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<tr>
<td></td>
<td>Dentists with hepatitis C</td>
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<tr>
<td></td>
<td>Dentists with tuberculosis</td>
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</tbody>
</table>

Introduction

The context of this section of the review is investigating the relationship between diseases and illnesses in dentists and their performance at work. The section begins with an assessment of the number of sick dentists, through an analysis of data from the GDC, NCAS, the Practitioner Health Programme (PHP) and the Dentists’ Provident Society. Long term general health and well being are considered, including cognitive performance. Important occupational health issues for dentists, including musculoskeletal problems and stress are also investigated. Other problems are described as “exposure specific” and include a variety of hazards in the dental workplace such as exposure to infectious diseases, chemicals such as mercury and ionising radiation. The section concludes with suggested areas for further research.

Understanding how many dentists are sick

In an attempt to quantify the number of sick dentists, the literature review was undertaken in combination with an enquiry to organisations including the GDC, NCAS, PHP and the Dentists’ Provident Society.

GDC Health Committee

The GDC Health Committee is one of three fitness to practise committees (GDC 2010). It can suspend or impose conditions on a dental professional where there is a need to protect the public, the public interest or the registrant themselves. Health procedures allow the GDC to act where a dental professional’s health problems may put patients at risk. The aim is to protect patients while offering dental professionals appropriate medical care and supervision and, whenever possible, to help them return to safe practice through guided recovery.

The GDC Health Committee considers cases of dental professionals, whose fitness to practise is affected by a physical or mental condition and who have been referred by the Investigating Committee.

Table 4 shows how the number of cases of dental professionals referred by the Investigating Committee, whose fitness to practise is affected by a physical or mental condition, generally increased between November 1991 and November 2003. The number of dentists seriously impaired increased from five to eight in this period, with a maximum of 10 reported between November 2000 and October 2002.
### Table 4. Cases considered by the GDC Health Committee between November 1991 and November 2003 (GDC 2010)

<table>
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</thead>
<tbody>
<tr>
<td><strong>New cases considered</strong></td>
<td>6</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>8</td>
<td>9</td>
<td>12</td>
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<tr>
<td><strong>Dentists not seriously impaired</strong></td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<td>3</td>
<td>4</td>
<td>1</td>
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<tr>
<td><strong>Dentists seriously impaired</strong></td>
<td>5</td>
<td>-</td>
<td>4</td>
<td>1</td>
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<td>3</td>
<td>3</td>
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<td>5</td>
<td>8</td>
<td>10</td>
<td>8</td>
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<tr>
<td><strong>Dentists with conditional registration</strong></td>
<td>2</td>
<td>-</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>8</td>
<td>5</td>
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<tr>
<td><strong>Dentists suspended</strong></td>
<td>3</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
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<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
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<tr>
<td><strong>Resumed cases considered</strong></td>
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<td>9</td>
<td>9</td>
<td>10</td>
<td>8</td>
<td>5</td>
<td>4</td>
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<td><strong>At year end</strong></td>
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</tr>
<tr>
<td><strong>Dentists suspended</strong></td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>4</td>
<td>7</td>
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<td>9</td>
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<tr>
<td><strong>Dentists with conditional registration</strong></td>
<td>5</td>
<td>5</td>
<td>7</td>
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<td>7</td>
<td>9</td>
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<tr>
<td><strong>Total with restrictions on registration</strong></td>
<td>9</td>
<td>7</td>
<td>9</td>
<td>5</td>
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<td>7</td>
<td>6</td>
<td>9</td>
<td>13</td>
<td>16</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

1. The number of resumed cases in any given year may include dentists whose cases have been considered more than once during the year either as new, resumed or adjourned cases.
2. The registration of one dentist was suspended pending the outcome of an appeal against conditional registration.
3. The case against one dentist was adjourned for a period of 12 months.
4. The case against one dentist was referred back to the President under rule 16(4) (C) of the Health Committee (Procedure) Rules 1984.
5. Includes the case of one dentist who has subsequently died.
6. The figures exclude one first application and one restoration when both dentists were not seriously impaired.
7. The figures exclude three voluntary erasures.

An examination of the more recent GDC Annual Reviews (GDC 2006, 2007, 2008) revealed the following data about the number of referrals to the GDC Health Committee (Table 5).
Table 5. The number of referrals to the GDC Health Committee in 2006, 2007, 2008

<table>
<thead>
<tr>
<th>Number of dentists referred to GDC Health Committee</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>2006</td>
</tr>
<tr>
<td>19</td>
<td>2007</td>
</tr>
<tr>
<td>23</td>
<td>2008</td>
</tr>
</tbody>
</table>

Details of the range of health problems, resulting in the referral of dentists, were only published for the year 2007. These included drug/alcohol addiction, which was the most common reason for referral, bipolar disorder, depression and schizoaffective disorders (Figure 5).

Figure 5. Primary impairment of professionals in health proceedings at end of 2007

The National Clinical Assessment Service (NCAS)

As stated in the report of NCAS Casework: The first eight years (NCAS 2009), by the end of 2008/2009 NCAS had received 562 dental referrals. The same information is collected about referred dentists as referred doctors so there is scope for comparison between the two professional groups.

The reasons for the referral of 1472 dental, surgical and other medical practitioners to NCAS in the first 15 months following the introduction of a new classification system at the end of 2007 are at Figure 6. It shows that 22 per cent of dentist cases were referred for health problems, including substance abuse, compared with 16 per cent of surgeons and 25 per cent of non-surgical doctors (NCAS 2009). NCAS decided to include surgeons in this comparative study because surgeons were considered to be more similar to dentists than GPs, as dentists undertake treatment interventions on patients. Dentists' work is similar to the practical nature of the work undertaken by surgeons, whereas GPs mainly undertake assessments and generally treat patients pharmacologically.
General observations from five years of NCAS dental assessment work include the fact that despite growing literature about stress and burnout in general dental practice, health issues have not so far featured in greater numbers than in medical cases. The concerns identified amongst referred dentists are generally very similar to those seen amongst doctors, but overall dentists are less likely to be referred to NCAS than doctors (NCAS 2009).

**The Practitioner Health Programme (PHP)**

The Practitioner Health Programme (PHP) operates in London. It is a free, confidential service for doctors and dentists who have mental or physical health concerns and/or addiction problems and who live or work in the London area.

According to the report on the *First Year of Operation* (PHP 2010), 184 practitioner-patients were seen by the service by the end of September 2009. 91 per cent (i.e. 167) of practitioner-patients were doctors and eight per cent (i.e. 15) were dentists. More men attended than women; the split being 53 per cent to 47 per cent. These results are considered to be representative of the gender of the regional workforce, as over 40 per cent of the London SHA medical and dental workforce (including General Practice and Hospital and Community sectors, and doctors and dentists) are women. However, due to the fact that the PHP offers a service to doctors and dentists both living and working within the M25, it is not clear to what extent the numbers of practitioner-patients is representative of the dental workforce. It may be that dentists are under represented in these figures.

Out of 114 practitioner-patients, (62 per cent) presented with mental health problems, 67 (36 per cent) presented with addiction problems and three (two per cent) presented with physical health problems. Overall a total of 17 patients had some form of physical health problem. These data are analysed further in Table 6.

**Table 6. Reasons for referral of healthcare practitioners to PHP**

<table>
<thead>
<tr>
<th>Mental health</th>
<th>Addiction</th>
<th>Physical health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression (29%)</td>
<td>Alcohol problems/dependence</td>
<td>17 patients: problems included</td>
</tr>
<tr>
<td></td>
<td>51/67 (77%)</td>
<td>cancer, deafness, multiple</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sclerosis (MS), brain injury</td>
</tr>
</tbody>
</table>
Anxiety and depression (11%)  
Substance misuse (23%), including ketamine, heroin, cocaine, amphetamine, cannabis

Anxiety (21%)  
Undiagnosed psychosis (5%)  
Other (34%), e.g. eating disorder, OCD, ADHD

The Dentists’ Provident Society (DPS)

Dentists’ Provident Society (DPS) Limited was established in 1908 with the objective of providing income protection insurance for dentists in the UK and Ireland. The society currently has over 13,000 members (Dentists’ Provident Society, Income Protection Claims Statistics 2009). As the GDC had approximately 37,000 dentists on its register in 2009, approximately 35 per cent of UK dentists were members of the DPS (GDC 2010).


Table 7. The number of claims incurred and paid, the male/female split and average age of claimant in the years 2006, 2007, 2008 and 2009.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of claims paid</th>
<th>No. of claims paid to male practitioners</th>
<th>No. of claims paid to female practitioners</th>
<th>Average age of claimant (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>1456</td>
<td>902</td>
<td>554</td>
<td>43</td>
</tr>
<tr>
<td>2007</td>
<td>1507</td>
<td>951</td>
<td>556</td>
<td>44</td>
</tr>
<tr>
<td>2008</td>
<td>1693</td>
<td>1039</td>
<td>654</td>
<td>43</td>
</tr>
<tr>
<td>2009</td>
<td>1567</td>
<td>955</td>
<td>612</td>
<td>44</td>
</tr>
</tbody>
</table>

The data listed above in Table 7 requires some explanation. The figures represent individual claims and thus the number of claims does not equal the number of individuals. It is possible for a single DPS member to make two separate claims in a year and this will therefore be counted twice. In addition, any member making a claim after a period of incapacity may find their claims “linked” together and therefore they will only be counted once. It is for this reason that actuaries do not tend to perform analyses on the number of claimants, but the amount of the claim – this is known in actuarial circles as “lives versus amounts” analyses, as it allows the identification of anti-selection (Dentists’ Provident Society, Income Protection Claims Statistics 2010).

Figures 7 and 8 show an analysis of the claims paid in 2009 by capacity and by gender (Dentists’ Provident Society, Income Protection Claims Statistics 2009).
Although this analysis is not fully exhaustive, and may not present data from all sources, it describes the range of problems encountered by dentists and gives an indication of their prevalence.

The general long term health and well being of dental practitioners

General health

Ailments concerning the loco-motor apparatus, cardiovascular problems, and neurotic symptoms have been identified as the main causes for British dentists to leave the profession before normal retirement age (Burke et al. 1997).

However, Gorter et al. (2000), in a study involving 709 actively practising dentists, found that eight per cent of general dental practitioners reported moderate to poor physical health. Kay and Scarrott (1997) similarly noted that nine per cent of general dental practitioners were found to have a moderate to poor physical health. A later study by Kay and Lowe (2008) showed that two-thirds of respondents considered themselves in very good or excellent health.

Obesity also appears to be a problem in dentistry. Key findings from the Health and Social Care Information Centre (2010) showed that in 2008, almost a quarter of UK adults (24 per cent of men and 25 per cent of women) were obese, and 66 per cent of men and 57 per cent of women were
overweight (including obese). However, the results of a study of 545 UK general dental practitioners revealed that 13 per cent of respondents were obese and 39 per cent were classed as overweight (Kay and Lowe 2008). These proportions are lower than the national averages described by the Health and Social Care Information Centre (2010), but are still high and are higher than those reported in another study of stress and health in UK dentists, which found that one third were overweight or obese (Myers and Myers 2004). This is a concern and may be related to the sedentary lifestyle of the GDP and possibly stress.

Cognitive impairment

Very little literature exists about the prevalence or impact of cognitive impairment amongst dentists. In 2008, 15 per cent of the dentists and doctors referred to NCAS due to performance concerns were referred with suspected cognitive difficulties. The evaluation of cognitive decline is relatively complex. Neuropsychological assessments are often required to elucidate the causes of performance problems and to better understand why previously capable and high functioning, highly intelligent individuals appear to be functioning at lower levels. Causes for this observed cognitive decline include depression, early dementia, multiple sclerosis, cerebrovascular disorder and alcohol misuse (Pitkanen et al. 2008).

At present, the prevalence of cognitive impairment amongst health care professionals is unknown. It is unclear whether different types of health care professionals are more likely to have any cognitive decline detected early. Team based professionals, such as hospital consultants and nurses interact with other health professionals on a daily basis and may therefore be informally monitored to a much greater extent than isolated professionals such as independent GDPs or other primary care based practitioners (Harvey et al. 2009).

Musculoskeletal complaints in dentistry

Prevalence of musculoskeletal complaints

The prevalence of musculoskeletal complaints in dentists is high and has been demonstrated in a wide variety of self-reported questionnaire-based studies.

In a survey of 430 dentists in Greece, Alexopoulos et al. (2004) demonstrated a high prevalence of back pain, neck, shoulder and hand/wrist complaints. 62 per cent of dentists who were surveyed reported at least one musculoskeletal complaint. Furthermore, 30 per cent reported chronic complaints, 16 per cent had spells of absence from work and 32 per cent had sought medical care.

From these results, the authors concluded that the physical nature of the clinical work seemed to put dentists at risk of developing musculoskeletal disorders.

These findings are similar to the results of a self-reported questionnaire study undertaken by Kay and Lowe (2008). Only 42 per cent were free from pain and discomfort and 26 per cent experienced levels of pain that prevented them from taking part in a few or some activities. A survey by Kay and Scarrott (1997), found that 22 per cent of British dentists experienced so much physical pain that it had limiting effects on working as a dentist, which may well compromise performance.

The principal aetiological factor in back pain has been identified as working with one’s back in an awkward position. Specifically, Kay and Lowe (2008) noted that this aspect of occupational health had not improved in the previous ten years. More than a quarter (26 per cent) of respondents to the survey always worked with their backs in an awkward position and 42 per cent often had back pain. In 1996, 24 per cent always had their backs in an awkward position and 41 per cent often did so. This is further supported by the results of a study of health in GDPs which found that 68 per cent of respondents reported backache or pains in the back (Myers and Myers, 2004).

The prevention of musculoskeletal complaints in dentistry

The main preventative interventions involve increased education and training to raise awareness of these problems and their causative factors. It is advocated that posture should be included in the dental school curriculum and dental students should be taught how to sit in a way that will minimise
their risks of back trouble (Kay and Lowe 2008). Similarly, Alexopoulos (2004) identified that
ergonomic and educational interventions may have a significant impact in the prevention of hand/wrist
complaints. Specifically, authors suggested that effective intervention strategies should consider both
ergonomic and cognitive-behavioural approaches.

**Exposure specific occupational health issues**

**Infectious diseases**

Exposure to blood-borne pathogens including hepatitis B (HBV), human deficiency (HIV) and hepatitis
C virus (HCV) poses a serious risk to healthcare workers involved in exposure prone procedures
(Araujo and Andreana 2002, Cleveland and Cardo 2003, Deisenhammer et al. 2006.). Oral and
maxillofacial surgeons are at particular risk due to the nature of their surgical work (Porter et al. 1994,
Fry 2005). The risk of transmission of mycobacterium tuberculosis can also occur in a clinical
environment, although the risk of transmission in a dental clinic setting is low (Feller et al. 2009). Each
of these diseases, and the impact upon practitioner performance, are considered in detail below.

**Hepatitis B**

Current advice from the Department of Health recommends that all workers who have direct contact
with blood and other potentially infectious body fluids should be immunised against hepatitis B
(Department of Health 1993).

The management of a dentist infected with hepatitis B is relatively straightforward, in that the
immunity/carrier status of staff performing exposure prone procedures should be determined to protect
patients against the risk of acquired hepatitis B from an infected healthcare worker. There is also
clear guidance about fitness to perform exposure prone procedures (Department of Health 2007).

**HIV**

In the case of an HIV-infected dentist, the working practices are more restrictive and are currently
under review. Policy and guidance relating to HIV infected healthcare workers is set out in a
Department of Health report, *HIV infected Health Care Workers: Guidance on Management and

In 1991, the United Kingdom Advisory Panel (UKAP) was set up under the aegis of the Expert
Advisory Group on AIDS (EAGA) to consider individual cases of HIV infected healthcare workers.

Although more recently the EAGA has advised that an HIV positive dentist may, under certain
conditions, provide clinical treatment for patients who are also HIV positive (Expert Advisory Group
2006), the advice from UKAP relating to exposure-prone procedures means, in effect, that dentists
who become HIV positive must cease clinical dentistry.

Work is currently being undertaken to examine the situation for HIV positive dentists in 32 other
European countries (BDJ 2009). Although there are still a few countries who have yet to respond, it is
reported that the information to date indicates that the countries of Europe are almost evenly split
between those where the dentist is able to work, and the situation that exists in the UK, where the
dentist must immediately stop working. There is a distinct lack of a robust evidence base in this field,
making it difficult for a universal science-based decision to be made. However, a consensus does
seem to be emerging. A study in Switzerland (Vernazza et al. 2008) concluded that HIV positive
individuals on effective antiretroviral therapy and without sexually transmitted infections are sexually
non-infectious.

The situation in the UK is thus viewed as somewhat restrictive and unfair. Williams (2009) identified
that forceful arguments exist that condemn the treatment of HIV infected dental healthcare workers
in the UK as unacceptable (Lewis 2006) and illogical (Martin 2006).

However, as highlighted by Hancocks (2007), it is promising to know that the UKAP, EAGA and the
Advisory Group on Hepatitis are currently reviewing existing policies on healthcare workers infected
with blood-borne viruses.
HCV

As HCV is transmitted primarily by contaminated blood, it represents a higher risk of nosocomial transmission to patients and healthcare workers (Henderson 2003). A study undertaken in a UK dental hospital (Lodi et al. 1997) suggested that since the prevalence of HCV infection in the UK general population varied between 0.08 per cent and 0.55 per cent, dental healthcare workers, and auxiliary staff may have a slightly increased risk of HCV infection. However, more recent studies demonstrate how dentists have a low risk of HCV infection caused by occupational accidents (Weber et al. 2001, Resende et al. 2009). Professional data, behaviour and occupational exposure were not considered to be associated with the seroprevalence of hepatitis C. This may be explained by the relatively low infectivity of HCV found in saliva or by the small volume of blood inoculation involved in dental accidents (Weber et al. 2001, Resende et al. 2009).

Tuberculosis

The risk of transmission of mycobacterium tuberculosis in a dental setting is low, but the consequences if it occurs, are grave. The greatest risk of mycobacterium tuberculosis transmission is associated with treating dental patients from communities with a high prevalence of tuberculosis (TB) and HIV disease because these patients may have active TB but be unaware of their status (Feller et al. 2009). Current dental literature describes the epidemiology of TB, advances in TB diagnostic methods and TB infection control guidelines for dental settings (Cleveland et al. 2009). However, there appears to be no research literature which examines the impact upon practitioner performance and ability to practise.

The use of mercury in dentistry and its impact on dental professionals

For many years, the use of mercury as a component of amalgam restorations and the later release of mercury from restorations has been a matter for concern, for both the profession and the public (Eley 1997). All forms of mercury have adverse effects on health at high doses. However, the evidence that exposure to very low doses of mercury has adverse effects is open to wide interpretation (Clarkson et al. 2003).

A cross sectional study of 180 dentists, in the west of Scotland, investigating the effect of chronic exposure to mercury on health and cognitive functioning, demonstrated several differences in health and cognitive functioning between dental participants and controls (Ritchie et al. 2002). However, the authors reported how these differences could not be directly caused by their exposure to mercury.

Based on present knowledge of the risk of environmental and occupational hazards from the use of mercury in dentistry, Preben Horsted-Bindslev (2004) made the following conclusions:

- Use of mercury in dentistry has decreased substantially, especially during the last decade
- Amalgam separators and safe collection, handling and storage of waste have shown to significantly reduce mercury discharge from the dental clinic
- The mercury body burden of dental staff will not differ from the general population if amalgam separators and safe collection, handling and storage of waste are ensured
- A subtle neuro-behavioural effect from long time work in dentistry cannot be ruled out. However, such effects may be caused by a variety of other factors including various chemicals, high-frequency vibrations and stress.

Cancer incidence in dentists

Simning (2007) completed a literature review to investigate dentist mortality and cancer incidence risk. It was concluded that for dentists, there was a normal or decreased risk of developing lung cancer, or any other cancer. Several studies reported an increased risk of developing skin cancer and, to a lesser extent, cancer of the brain and reproductive organs. However, the reasons for these increased risks were unknown. Exposure to certain hazards in the workplace, social status or the level of education could all be factors. In light of these conflicting findings and methodological limitations of the published studies, the author concluded that there was little evidence to suggest a work-related increase in cancer risk among dentists.
Understanding the relationship between burnout risk and health

As explored later in more detail in Section 5, professional burnout is considered a possible long term consequence of occupational stress (Gorter et al. 2000). Many studies have demonstrated significant levels of stress experienced by general dental practitioners (Kay and Scarrott 1997, Myers and Myers 2004).

In The Netherlands, a number of studies have investigated the incidence and levels of burnout among dentists and it appears that 13 per cent of the Dutch dentists suffer from “high general levels of burnout” while still working (Gorter et al. 1998 & 1999).

However, there is less literature that describes the relationship between burnout and health. In a more recent study Gorter et al. (2000), found that dentists with a high burnout risk reported health complaints to a greater extent than dentists with a low burnout risk.

Areas for future research

There is a need for greater knowledge about the prevalence of physical illness in dentists and how this impacts upon clinical performance. Qualitative studies exploring the effects of illness on performance as well as attitudes to managing illnesses would be especially beneficial. In particular, more research is necessary to enhance the understanding of cognitive impairment; its relevance to clinical practice and methods of assessment. Regarding musculoskeletal conditions, an in depth analysis of the psychosocial factors and coping strategies involved in the occurrence and persistence of musculoskeletal complaints could be especially useful. There is little research literature which focuses on the hazards of tuberculosis, hepatitis C and sexually transmitted diseases (other than HIV) for general dental practitioners. Further research in this area, with a particular focus on the impact upon performance, could be especially useful.

Conclusion

- It is difficult to ascertain the numbers of dentists that are sick, but the data from various organisations suggests that the problems encountered by dentists are similar to doctors in terms of their behaviour, health problems or reasons for referral to a support organisation.
- Obesity is considered a particular problem in dentistry and the prevalence of musculoskeletal complaints appears to be high. Back pain, neck, shoulder and hand/wrist complaints are reported to be a particular problem and it was found that dentists sometimes experienced such high levels of physical pain, that it limited their ability to work.
- Emphasis should be placed on developing undergraduate educational interventions which consider both ergonomic and cognitive-behavioural approaches in the prevention of musculoskeletal problems, particularly back pain and hand/wrist complaints.
- Infectious diseases are reported to be important health issues for dentists. The management of a hepatitis B infected clinician is relatively straightforward in that objective tests for hepatitis B antigen exist and there is clear guidance about fitness to perform certain exposure-prone procedures. However, the situation for the HIV infected dentist is less clear. The treatment of such dentists has been described as unfair and the existing policies on healthcare workers infected with blood-borne viruses are currently being reviewed.
- There is no evidence to suggest any negative effects of amalgam on the health of dental professionals when amalgam separators and safe collection, handling and storage of waste are used.
- There is little evidence to suggest any work-related increase in cancer risk among dentists, due to the risk of exposure to dental amalgam or ionising radiation.
- Finally, many studies demonstrate significant levels of stress experienced by general dental practitioners. It is suggested that dentists with a high burnout risk report health complaints to a greater extent than dentists with a low burnout risk.
- Areas for future research include:
  - investigating the prevalence of physical illness in dentists and how this impacts upon clinical performance
• undertaking qualitative studies exploring the effects of illness on performance, as well as attitudes to managing illnesses
• investigating cognitive impairment; its relevance to clinical practice and methods of assessment
• investigating the incidence and prevalence of musculoskeletal disorders in dentists
• an in depth analysis of the psychosocial factors and coping strategies involved in the occurrence and persistence of musculoskeletal complaints
• examining the impact of diseases such as tuberculosis, hepatitis C and sexually transmitted diseases (other than HIV) upon clinical performance.
References


National Clinical Assessment Service. NCAS Casework: The first eight years. September 2009


Section 5: Stress, burnout and other work place related illnesses in dentistry

Search terms

The search terms used in this domain are listed in Table 8.

Table 8. Search terms used to investigate stress, burnout and other work-related illnesses in dentistry.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Search Terms Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress, burnout and other work place related illnesses in dentistry</td>
<td>Stress</td>
</tr>
<tr>
<td></td>
<td>Stressed</td>
</tr>
<tr>
<td></td>
<td>Job demands</td>
</tr>
<tr>
<td></td>
<td>Burnout</td>
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<tr>
<td></td>
<td>Stress management</td>
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<td></td>
<td>Workload</td>
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<tr>
<td></td>
<td>Depression</td>
</tr>
<tr>
<td></td>
<td>Suicide</td>
</tr>
<tr>
<td></td>
<td>Dentist stress and performance</td>
</tr>
</tbody>
</table>

Introduction

Mental health problems and work place related illnesses in dentistry have been investigated for some years, with studies which have considered the risk factors of occupational stress, burnout, depression and related alcohol and substance misuse (Gorter et al. 2000, Myers and Myers 2004, Kay and Lowe 2008, Te Brake et al. 2008a, Harvey et al. 2009).

It is generally accepted that dentists encounter numerous sources of stress throughout their career, beginning as early as when they are at dental school (Newbury-Birch et al. 2002). On entering general dental practice, the number and variety of organisational and individual stressors can often grow (Kay and Lowe 2008). For some dentists, these issues may significantly affect their general and/or mental health (Myers and Myers 2004). Clinical disorders such as burnout (Gorter et al. 1998) and depression (Gale 1998) may then result.

This section focuses primarily on studies involving stress, burnout and depression since they are strongly correlated. The co-morbidity between stress and alcohol use is discussed. Alcohol and substance misuse in general are discussed in greater detail in Section 6.

In addition, this section examines the levels of stress, burnout and depression in dentists and the consequent impact upon patient care. Risk factors are also identified at an individual and organisational level for each of these conditions. Finally, interventions for the prevention and the management of such problems are outlined. The section concludes with suggested areas for further research.

Setting the context: Why do these factors need consideration?

Harvey et al. (2009) outlined a number of reasons why the mental health of health care professionals requires specific consideration:

- The NHS is Europe’s largest employer
- There have been a number of reports suggesting that health care professionals feel more stressed than other workers and may be at increased risk of developing mental disorders
- Healthcare professionals, especially doctors, are reluctant to access appropriate care for themselves
- Illness in health care professionals has the potential to impact on patient safety and the operational effectiveness of the NHS.
What is stress?

George and Milone (1986) defined stress as the biological reaction to any adverse internal or external stimulus – physical, mental or emotional – that tends to disturb the organism’s homeostasis. If the compensating reactions are inadequate or inappropriate, they may lead to a stress-related disorder. However, the authors note that not all stress is negative. Certain stressors will motivate individuals to make a greater effort; for example, a particularly demanding patient may motivate a dentist to work at an exceptionally high level, resulting in the creation of a highly aesthetic restoration. Thus certain stressors can stimulate people to develop professionally, both in a clinical capacity and personally.

Levels of stress in dentists

Dentistry has previously been described in the literature as a stressful occupation (Blinkhorn 1992, Wilks 1995, and Wilson et al. 1998).

Studies have suggested that dentistry generates more stress than any other profession, primarily because of the nature and working conditions of the dental surgery (Cooper et al. 1987, Moore and Brodsgaard 2001).

In a more recent study, Myers and Myers (2004) investigated overall stress, work stress and health in general dental practitioners. A nationwide anonymous cross-sectional survey was undertaken using stratified random sampling of 2,441 GDPs in the UK. A comparatively large number of dentists reported high levels of psychological stress symptoms, such as being nervy, tense and depressed; some even showed minor psychiatric symptoms. 58 per cent reported headaches, 60 per cent reported difficulty in sleeping and 48 per cent reported feeling tired for no apparent reason. These were all related to work stress. The use of alcohol was also related to high work stress. Overall, these findings indicate the stressful nature of dentistry and difficulties in working conditions. It is also possible that clinical performance could be compromised by undiagnosed systemic diseases e.g. diabetes, but the extent to which this occurs in dentists has not been investigated.

These studies focus on UK dentists, but it is worth noting that similar studies abroad have demonstrated comparable findings. In the USA, Gale (1998) proposed that dentists perceive dentistry as being more stressful than other occupations. Similarly, a study of more than 3,500 dentists found that 38 per cent of those surveyed were always or frequently worried or anxious (Dunlap and Stewart 1982). Moreover, 34 per cent of the respondents said that they always or frequently felt physically or emotionally exhausted. In South Africa, Möller and Spangenberg (1996) demonstrated that dentistry is also considered to be a stressful occupation in private dental practice.

Recent longitudinal studies have showed little change in the levels of stress experienced by practitioners in the last decade. A study of dental professionals’ health and well being carried out by the British Dental Association (BDA) by Kay and Scarrott (1997) indicated that many respondents had fairly or very stressful lives. Life was described as very stressful by 25 per cent of the dentists and as rather stressful by 60 per cent.

In the subsequent study the authors noted that in spite of the dramatic contractual changes to dentistry which had begun to take place in this period, there was not a great deal of difference between the results of this study and the results of the research carried out in 1996 (Kay and Lowe 2008). Dentists did not appear to be any more stressed than they were in 1996. It was generally felt that dental practice can cause stress, but stress can be positive. The proportion of respondents who were happy and interested in life remained similar (53 per cent, compared with 50 per cent in 1996). However, the proportion of respondents who considered their lives to be very or fairly stressful remained high.

Risk factors for stress

Risk factors at university and during Vocational Training

The literature demonstrates how many dentists develop stress disorders early in their careers, and studies have shown increasing evidence of stress-related problems in young dentists and dental students (Humphris 1999, Newbury-Birch et al. 2002, Willet and Palmer 2009).
In one study undertaken in Newcastle Dental School, 67 per cent of students in the final year of training had experienced possible pathological anxiety. Interestingly, the proportion of dentists suffering from stress decreased from 72 per cent as final year students to 19 per cent as dentists (Newbury-Birch et al. 2002).

For dental graduates entering primary care, there is some evidence that the abrupt change from student to dental practitioner has been somewhat eased with the introduction of mandatory vocational training in the 1990’s (Baldwin et al. 1998). A more recent survey of 606 vocational dental practitioners (VDPs) undertaken in 2007 revealed that causes of anxiety and concern mainly focused on the recent contractual changes to NHS dentistry (Willett and Palmer 2009).

Furthermore, young dentists reported various sources of stress for which many feel underprepared (Humphris 1999). Vocational training appears not to have prepared young dentists for the administrative responsibilities involved in running a practice, and these aspects of work continue to be a source of stress. Such stressors in the early years of practice come from the combined effects of the high number of patients to be seen in a day, finances in general, not knowing what to expect as an associate, making mistakes, the fear of litigation, and the belief that patients can be too demanding (Baldwin et al. 1999).

Risk factors after completion of Vocational Training

Many factors have been identified in the literature as possible contributors to stress for dentists who are established general dental practitioners. There has been considerable debate in the literature about the relative importance of individual and organisational factors in terms of predicting stress, but evidence shows that both play a role. These are now described in greater detail.

Organisational causes of stress

These include patient demands, practice management/staff issues, fear of complaints/litigation, non-clinical paperwork (Kay and Lowe 2008). The emotional demands of working with patients has also been identified as contributing to high levels of stress, for example, dealing with nervous or anxious dental patients or managing patient demands.

Myers and Myers (2004) revealed further work stressors related to working in NHS practice. Work stress was associated with overall stress in a GDP’s life with work stressors contributing highly to overall stress. There were some gender differences in work stressors, although regional differences were minimal. A particularly important finding was that factors in the dental surgery contributed to nearly half of the overall stress in a GDP’s life, especially fragility of dentist-patient relationship, time and scheduling pressures, staff and technical problems, job dissatisfaction, percentage NHS and number of hours worked per week. ‘Running behind schedule’ and ‘coping with difficult uncooperative patients’ were the highest rated work stressors. Interestingly, a high percentage of NHS dentistry was associated with high levels of overall stress. Similar work stressors were identified in accord with previous studies undertaken by Moller and Spangenberg (1996), Wilson et al. (1998) and Gorter et al. (1999).

Cooper and Humphris (1998) highlighted an additional stressor which concerned uncertainty felt during times of change. This is an important factor given the subsequent changes that NHS dentistry has undergone in the last decade.

Individual causes of stress

Various individual causes of stress also exist. These are mainly concerned with aspects of one’s personality and life circumstances, health, and levels of previous experience. However, the relationship between individuals in the dental team, including bullying, can also be contributing factors.

Setting unrealistic goals

George and Milone (1986) highlighted that setting unrealistic goals can generate significant negative stress. Such goals may include the need for a particular level of income or technical perfection.
Stress tolerance and life circumstances

It has been suggested that the level of stress that an individual can tolerate comfortably varies not only with the accumulative effect of the stressors, but also with such factors as personal health, amount of energy or fatigue, family situation and age. Stress tolerance usually decreases when a person is unwell or has not had an adequate amount of rest. During major life changes (birth of a child, serious accident to family member or oneself, divorce, death, geographic relocation), people's ability to tolerate stress is also compromised.

Previous experiences

George and Milone (1986) considered that previous experience can enhance an individual's ability to manage stress and develop coping skills. After several similar experiences, individuals generally learn a standard way of managing a particular stressor.

This view has been supported by Bourassa and Baylard (1994) who demonstrated that in general, as a dentists' number of clinical experiences increase, they report a lower overall perception of stress. Only stress resulting from office management/administration remains high, despite the dentists' clinical experience.

George and Milone (1986) also explain how stress tolerance will often vary according to the individuals who surround us. This is important considering that dentists receive insufficient training in practice management and may lack skills to remedy work conflicts with dental assistants (Rada and Johnson-Leong 2004).

Positive working relationships

Working with supportive colleagues can help to mitigate the effects of stress. Dentists and dental care professionals who have a positive working relationship can reinforce one another and help raise one another's tolerance of stress (George and Milone 1986).

Bullying in the workplace

Conversely, bullying in the workplace could be viewed as an aetiological factor in stress. No literature exists on the prevalence of workplace-related bullying of dentists in general dental practice. The only published studies have examined levels of workplace bullying within the NHS in general and within postgraduate hospital dentists. Nevertheless, relevant associations can still be made.

Several studies have identified the prevalence of workplace bullying and associated occupational health outcomes among various NHS staff in the UK. For example, Quine (2002) reported that over a third of junior doctors identified themselves as victims of bullying.

Quine (1999) has shown that, compared to those who were not bullied, victims of workplace bullying suffer from adverse occupational health outcomes, including lower levels of job satisfaction, a higher propensity to leave, and higher levels of anxiety and depression.

In a more recent study, Steadman et al. (2009) determined the prevalence of bullying and experience of bullying behaviours among postgraduate hospital dentists. The study was conducted among a sample of 227 dentally qualified trainees within the UK's Hospital Dental Service. 34 (25 per cent of respondents) identified themselves as victims of bullying, and 63 (47 per cent) had witnessed their colleagues being bullied. Irrespective of whether or not they labelled themselves as victims of bullying, in the previous year 82 (60 per cent) of these hospital dentists had experienced one or more of the bullying behaviours included in the checklist used in the study.

The authors thus concluded that there were significant levels of experience of bullying behaviours among the postgraduate dentists involved in the survey. The prevalence of these behaviours is generally consistent with levels reported within other NHS settings that used the same definitions and timeline as the current study. Thus one can infer from these results, that workplace related bullying is
likely to occur in other settings, such as general dental practice or the salaried services, despite differences in team structure and working dynamics.

**Stress and health**

Finally, it has also been identified that stress after having experienced a physical illness was a crucial factor in early retirement (Burke et al. 1997). This is particularly pertinent given the range of musculoskeletal disorders (Alexopoulos et al. 2004, Myers and Myers, 2004, Kay and Scarrott, 1997, Kay and Lowe 2008) and other complaints, such as obesity, associated with general dental practitioners (Myer and Myers 2004, Kay and Lowe 2008).

**Barriers - the reluctance to seek help**

Barriers to seeking help can be viewed as a risk factor in the development of stress. This may be due to a failure or reluctance by an individual to admit that a problem which requires medical intervention or support may exist.

Harvey et al. (2009) described how many health care professionals are reluctant to seek help when they suffer from symptoms of mental disorder. This may be due to a range of factors, including a belief they are not susceptible to illness, a professional culture of self reliance and coping, guilt over the possibility of cancelling patients and missing work, stigma and the fear of involvement of the regulating authorities. In the case of mental disorders, the authors suggest that concerns over confidentiality are one of the main barriers preventing health care professionals seeking help. Furthermore, when discussing the availability of successful strategies to prevent and treat stress, anxiety and depression in dentists, some have claimed that “the only limitation is their willingness to take care of themselves” (Rada and Johnson-Leong 2004).

Lavine et al. (2004) add the dynamics of the professional role to this list of contributing factors. The authors describe how dentists are acutely aware of the image they project in the community, because it is directly related to their ability to attract patients and to be professionally successful. It is thus understandable how many would be fearful that treatment for addictive disease or a mental disorder could adversely affect their reputation.

**Intervention: The management of stress in general dental practice**

It has been suggested that the main challenges for the dental profession are developing tailor-made prevention and intervention programmes specifically aiming at the needs within the dental profession (Gorter et al. 2000). Myers and Myers (2004) state that interventions should be developed to support dentists in reducing the stress experienced in the dental surgery.

This is reinforced by Kay and Lowe (2008) and Atkinson et al. (1991) who have suggested how stress management and personal and professional awareness training should be included in the undergraduate curriculum, so that threats to physical and mental well being which might occur during a dentist’s professional life may be avoided or addressed. Lavine et al. (2004) add business management and communication skills to this list. The authors also highlight that in the USA, dental associations offer stress management workshops, professional help, counselling services and support networks. Because most dental practices are small, dental societies have a role in providing venues in which dentists can forge connections with each other and thus are well-positioned to provide education and assistance in areas of personal well being.

Blinkhorn (1992) suggested how practising dentists can benefit from using stress management techniques. Stress management workshops focusing on stress relieving interventions may include deep breathing exercises, progressive effective relaxation of areas of the body, listening to audiotapes of oral instructions on how to relax, meditation, information on the topics of practice and business management, time management, communication and interpersonal skills, and the use of social support systems such as study groups or organised dental meetings.
The workshops would be structured to improve dentists’ coping skills and support them in managing stressors intrinsic to the profession. Professional help or counselling services may also be necessary if the effects of stress are affecting the person’s normal lifestyle.

Finally, and perhaps most crucially, Lavine et al. (2004) noted that dentists need to be aware of these issues. They should be able to assess their own attitudes and expectations to determine if they are realistic, achievable or rational. Dentists must acknowledge and accept that help is readily available if the effects of stress become overwhelming.

**Burnout**

As described by Freudenberger (1974), and Gorter et al. (1998), one of the possible consequences of chronic occupational stress is professional burnout. There is significant evidence in the literature to demonstrate that professional burnout is by no means rare among dentists.

**Defining burnout**

The most widely accepted definition of burnout consists of three dimensions as described by Maslach and Jackson (1986). The first, called emotional exhaustion (EE), emphasises becoming mentally or emotionally exhausted. The second, the development of a negative, cynical attitude towards one’s clients or patients, is known as depersonalisation (D). The third dimension is the tendency to evaluate oneself negatively, and is called personal accomplishment (PA). Professionals may feel unhappy about themselves and feel dissatisfied with their accomplishments. Van Dierendonck (1994) considered emotional exhaustion to be the key dimension, showing the most robust association with various job stressors, such as work overload, role problems, or lack of social support.

**Levels of burnout**

In current scientific research, measurement of burnout is usually carried out using the Maslach Burnout Inventory (MBI), as described by Maslach and Jackson (1997). The MBI measures the three dimensions of burnout mentioned above: emotional exhaustion, depersonalisation, and (diminished) personal accomplishment.

Burnout has been the topic of studies among dentists in various countries. In the UK, Osborne and Croucher (1994) concluded that approximately 12 per cent of UK dentists were at risk of burnout. In the Netherlands, Gorter et al. (1999) and Te Brake et al. (2007) identified that 13 to 16 per cent of Dutch dentists had high overall levels of burnout, whereas three per cent were considered to be fully burned out while still working. Burnout thus can be considered a serious risk to the dental profession, being both a threat to the available work force and a personal tragedy for the individual dentist.

**Risk factors for burnout**

Burnout is considered a long term possible consequence of having to deal with occupational stress. As described previously in numerous studies, the dental profession is full of possible threats to the dentist’s health, both mentally and physically. Again, these have been divided into organisational and individual factors and are described in detail below.

**Organisational causes of burnout: General Dental Practice**

Gorter et al. (1998) demonstrated how certain aspects of dental practice, such as time pressures, patient-related problems and management of auxiliary staff, were contributory factors. More specifically, features of the dentist’s work organisational structure, rather than managing patients or the dentist’s personal characteristics can play an important role in the development of burnout. However, levels of social support in the workplace, measured by the number of dentists in a practice, can also have a protective role against some aspects of burnout (Croucher et al.1998, Denton et al. 2008).

Both the April 2006 contractual reforms, and the preceding fee-per-item treadmill, have been reported to be the origin of the severe work pressures experienced by UK general dental practitioners (Denton et al. 2008). The researchers also found that dentists who spent a greater proportion of their time in NHS practice were more likely to have high burnout scores and low work engagement scores.
For the young dental graduate, Gorter et al. (2007) identified that burnout is not a significant risk. However, practice management was highlighted as being a particular concern for this cohort of dentists.

**Individual causes of burnout**

Individual causes of burnout include demographic considerations such as gender, as well as clinical specialty area and an individual's own ability to cope. These are described in greater below.

**Gender related differences in burnout**

The literature shows how gender related differences in burnout do exist, and it is important to understand the possible contributing factors. Te Brake et al. (2003) showed that male dentists reported a higher score on the depersonalisation dimension of the MBI than female dentists. However, there were no gender related differences found in the other dimensions i.e. emotional exhaustion and personal accomplishment. In addition, no gender related differences were noted in the level of work stress experienced, nor in the health of dentists included in the study. However, male dentists were noted to be working for more hours per week and seeing more patients, in comparison to female dentists. Additionally, a difference in mean age was found in that on the whole women were younger. However, the fundamental finding was that any difference in depersonalisation was eliminated when the factors of working hours and age were controlled.

The authors concluded that gender differences in burnout amongst dentists do exist. However, the results indicated that underlying factors such as working hours may have a profound effect on these differences. It seems obvious to attribute the higher D score in male dentists to a higher number of working hours per week. However, the results did not preclude alternative explanations. For instance female dentists may reduce their working hours to adapt to adverse working conditions, such as increased workload or feelings of emotional exhaustion. Their reduced D scores could thus be viewed as a positive outcome of an adaptive coping strategy.

**Working environment and setting**

It is interesting to note that the risk of developing burnout is not equal across different specialty areas. Humphris (1998) and Kaney (1999) investigated three types of clinicians, and found that general dentists and oral surgeons had the highest levels of burnout, and that orthodontists had the lowest levels of burnout. These findings support earlier research which identified that although short term stressors amongst hospital dental staff were not different between the specialties of restorative dentistry, oral surgery and orthodontics, longer term effects were identified (Humphris et al. 1997).

**Coping strategies: Limiting the risk of burnout**

Little is known about how dentists manage to cope with the demands of their job and stay engaged in their work. This information is key to the prevention of such problems. However, Hakanen et al. (2005) examined how 1,919 Finnish dentists employed in the public sector managed to cope with demanding aspects of their job demands and stay motivated and engaged in their work.

Dentists’ working conditions were classified into two broad categories which impact upon well being at work: job demands and job resources. Job demands/work stressors refer to those characteristics of the job that potentially evoke strain, in the event that they exceed the employee’s adaptive capability. Job resources refer to those physical, psychological, social, or organisational aspects of the job that: (i) reduce job demands and the associated physiological and psychological impact, (ii) are effective in achieving work-related targets, or (iii) stimulate personal growth, learning and development.

The main conclusion from the study was that job resources help dentists to cope with the demanding aspects of their job, and help dentists to stay engaged and motivated. The results showed that resources at work, such as positive patient and peer contacts, and possessing a variety of professional skills, are able to reduce the negative impact of job stressors. Thus, dentists felt motivated, dedicated to, and engaged in their work, despite the various demands of the job, such as
high workload, emotional dissonance, and the negative impact of the recent contractual reforms on dentists' work, but only if their job resources were relatively high.

The practical implication of these findings was that dentists should try to develop and enhance job resources in order to stay engaged in their work. Results suggested, for example, that dentists who tried to consistently improve their work, were best able to deal with their job demands.

Understanding the role of job resources in coping with the demanding aspects of one’s job may thus be key in the prevention of job stress and burnout among dentists. Improving the working environments of dentists (i.e. developing job resources), will motivate dentists and improve their ability to cope with challenging aspects of the job and promote feelings of vigor, dedication, and absorption. A suggested approach included making contact with dental peers and colleagues in neighbouring dental practices to establish communication channels, and develop a network.

The risk of developing burnout

Te Brake et al. (2008a) investigated changes in burnout levels among dentists involved in studies in 1997, 2000 and 2001, to attain a unique, longitudinal insight into potential changes in the risk of developing burnout among dentists over this period. No such effects were found when comparing mean levels of EE, D, and PA. However, the relative percentage of burnout risk among dentists indicated a substantial increase between the 1997, 2000, and 2001 samples.

In an earlier study, Te Brake et al. (2007) demonstrated that early signs of emotional exhaustion, as well as feelings of reduced personal accomplishment, should be taken as early warnings for burnout risk. However, because reduced personal accomplishment is a somewhat diffuse concept, emotional exhaustion is more likely to be the first noticeable effect of a pending burnout. This supports the notion that emotional exhaustion is the key dimension of burnout, as described by Van Dierendonck et al. (1994).

The impact of burnout

The process of burnout is usually accompanied by gradual negative changes in one’s emotional, cognitive, or behavioural patterns or, most probably, a combination of these (Te Brake et al. 2008a).

Gorter et al. (2000) reported that dentists with a high burnout risk reported health complaints more commonly than dentists with a low burnout risk. They also reported more unhealthy behaviour in terms of a lack of physical exercise/sport, increased alcohol consumption and an unhealthy diet. The authors thus concluded that dentists with burnout are not only managing mental pressures, but also experience greater physical problems. This is discussed in further detail in Section 4 of this review.

Conversely, Cherniss (1992) suggested that burnout does not necessarily always have negative consequences, in the longer term. Health professionals who burn out relatively early in their careers are more likely to stay in their chosen career and adopt a more flexible approach to their work routines. Conversely, studies have also demonstrated that a lack of career perspective is also considered a crucial factor in the development of burnout (Gorter et al. 1998).

Gorter et al. (2000) examined the impact when a professional denies having burnout. One of the dangers of denial is that the early signs of burnout will be hidden by the individual, who may fail to seek help when necessary.

Dentists are at least as vulnerable as anyone to self-judgment and the fear of being stigmatised. Thus dental schools and supporting organisations may need to consider how the current professional culture in dentistry contributes to the creation of such stigmatism.

Depression and suicide in dentists

Gale (1998) argued that depressive disorders are observed frequently in dentists. Furthermore, Rada and Johnson-Leong (2004) suggested that many of the personality traits that characterise a good dentist can also predispose dentists to depression. The literature demonstrates varying levels of depression and psychological distress in dentists, using a range of measures (Cooper et al. 1987,

In a nationwide cross-sectional survey of 2,441 GDPs in the UK, Myers and Myers (2004) demonstrated through the general health questionnaire, that levels of minor psychiatric symptoms were high, with 32 per cent of cases identified.

In a questionnaire study involving 1000 BDA members in 2005, Kay and Lowe (1998) investigated self-perceived general well being, and then compared the results to a BDA study of dental professionals’ health and well being undertaken in 1996. Results showed that more than half (57 per cent) of respondents mostly had feelings of positive well being, and only one per cent experienced mainly negative feelings. 12 per cent (62) of dentists had thought about committing suicide, and of those 18 had considered this in the past year. Seven respondents had actually attempted suicide, but none had done so in the past year.

In the 1996 study, analysis of the General Well being Scale demonstrated that 86 per cent had feelings of positive well being, whilst seven per cent felt moderate distress and four per cent were under severe distress. 12 per cent (91) of dental professionals (GDPs and dental support staff) had thought about committing suicide, 31 in the previous year. In 1996, 13 respondents had attempted suicide, one within the past year (Kay and Scarrott 1997). Such thoughts of suicidal elation have also been reported in a study involving 311 general dental practitioners by Moller and Spangenberg (1996). Approximately ten per cent of the private practitioners and two per cent of the non-private practitioners reported severe suicide ideation.

The evidence suggests that depression and psychological distress can also occur in dental students. In a longitudinal study undertaken at Newcastle University, a cohort of dental students were surveyed in 1995 and 1998, as second and final year undergraduate students respectively, and after one year working as qualified dentists. The Hospital Anxiety and Depression (HAD) scale was used for measurement of subjective anxiety and depression. Results demonstrated that 15 per cent of dental students as second year students, 14 per cent as final year students and two per cent as dentists were depressed according to the HAD scale.

In examining the factors which may predispose to depression in dentists, a study undertaken in the USA sought to identify the association between dental specialty and gender, and the depression scores of dentists, using the Zung Self-Rating Depression Scale to measure depression (Mathias et al. 2005). The sample size was 560 and included general dentists, endodontists, oral and maxillofacial surgeons, orthodontists, paediatric dentists, periodontists and prosthodontists. Results demonstrated that gender was significantly related to depression, but only in two specialties: periodontics and paediatric dentistry. However, these results need to be interpreted with caution as this study sampled disproportionately from women, which would tend to result in a higher prevalence of depression. The most important finding of the study was that only 15 per cent of depressed dentists were receiving treatment. The authors suggest that depressed dentists, like people suffering from depression, tend not to seek treatment, but implications upon the quality of care provided must be considered.

Cooper et al. (1987) utilised the Crown-Crisp Experiential Index to measure psychological well being and mental health of subjects. The study demonstrated further gender-related differences whereby male dentists showed significantly higher average scores on four sub-scales of the mental health index: free-floating anxiety, phobic anxiety, depression and hysterical anxiety than the normal population. Female dentists had higher scores on only two sub-scales: free floating anxiety and hysterical anxiety.

Another factor to consider is burnout. Humphris (1998) argues that there may be an association between burnout and depression, possibly due to one of the components, emotional exhaustion, which includes elements of fatigue overlapping with measures of depression.

Furthermore, the media repeatedly portrays dentists as being at risk of committing suicide, and the literature suggests that this may be true. Comparative studies indicate that suicide rates are elevated
amongst healthcare professionals. Data collected by the Office of National Statistics (ONS) from death registrations in England and Wales between 2001 and 2005 indicated that certain professions have a higher likelihood of death occurring by suicide than the population overall. These include male dentists, male and female medical practitioners, male and female nurses (Meltzer et al. 2008). A further analysis of ONS-based data reported that the suicide rate amongst male dental practitioners was approximately two and a half times the national average (Kelly and Bunting 1998). However, there are few studies that have investigated the relationship between stress and suicide. Alexander (2001) stated that the relationship between professional stress and suicide, if any, has not been substantiated or quantified.

Alexander (2001) concluded that a full understanding of suicide’s incidence, causes and prevention is required. It is therefore recommended that the profession should identify the causes of stress-related suicides and seek to provide assistance to those people who are affected by stress.

**Areas for future research**

**Stress**

Myers and Myers (2004) identified a range of areas for further research, focusing on stress experienced by NHS general dental practitioners. This is principally due to the fact that a large percentage of NHS dentistry has been associated with high levels of overall stress in GDPs’ lives. It would also be interesting to explore the factors which cause stress in those practitioners working in different clinical settings to include the private sector, dental bodies corporate and the salaried services.

More robust research methods are also suggested and are described in greater detail in the discussion section of this review. Another view was expressed by Myers and Myers (2004) who suggested that instead of using a self-reported, cross-sectional survey to investigate overall stress, work stress and health in general dental practitioners, a longitudinal study measuring a group of dentists over time would be more robust. The use of physiological measures (e.g. 24 hour blood pressure monitoring) and biological measures (e.g. salivary cortisol) of stress were also proposed.

The use of alcohol was also related to high work stress (Myers and Myers 2004). These authors suggested that the relationships between alcohol and stress should be further explored.

The future of new dental graduates has been identified as more uncertain than in the past (Willet and Palmer 2009). Further research needs to be undertaken to investigate the pressures faced by new graduates and the effects they may have on the clinical performance of future dentists.

**Burnout**

Te Brake et al. (2008b) identified that it is vital to develop an understanding of the mechanisms that form part of the burnout process in dentists, in order to effectively prevent and manage such problems. Therefore, monitoring levels of burnout risk should be a high priority in future research.

Furthermore, little is known about how dentists manage to cope with their job demands and stay engaged in their work. Future research should thus investigate the role of personal attributes in the relationship between working conditions and levels of engagement (Hakanen et al. 2005).

Finally, Te Brake et al. (2003) highlighted that further research is required in the field of gender related differences in dentist burnout, ideally in a longitudinal design, to overcome the limits of the cross-sectional design. Furthermore, it was stated that future research could investigate specific factors such as working hours and age.

**Depression and suicide**

The literature shows that depressive disorders are observed frequently in dentists, and certainly, this is an area in which more research is needed, especially in relation to the possible association with suicide.
In addition, factors which may predispose to depression need to be considered, including dental specialty, gender, and burnout.

Alexander (2001) identified that a greater understanding of suicide’s incidence, causes and prevention is required in order to implement appropriate and effective interventions. The following research questions were proposed as areas of future investigation:

- Has the incidence of dental suicides changed over time, since the number of female and ethnic minority dentists has increased in recent years?
- Has the character of dental practice changed in recent years? Could this be a factor that has contributed to any change in the prevalence of dental suicides?
- Are female dentists more susceptible to stress-related suicide?
- Are dentists’ suicides causally related in any way to personal or practice stressors such as divorce or litigation?
- Is there a definable relationship between smoking, caffeine intake or both and suicide, as studies in the nursing literature suggest? If so, do they affect men and women equally?
- Are the personalities of those who are drawn to dentistry more susceptible to suicidal ideation than those of professionals in other white-collar occupations, as suggested by some studies on doctors?

Such research questions will contribute significantly to the general body of evidence investigating stress in general dental practice, and its impact on the mental health of dentists.

**Conclusion**

- High levels of workplace stress, burnout and other “work-related” mental illness have been reported in dentists both in the UK, and abroad.
- There appears to be an emerging link between such factors and alcohol and/or drug misuse.
- Stress can be a positive factor which stimulates and enhances well being, both promoting and enhancing performance. Stress creates negative impacts only if it is overwhelming.
- Numerous sources of stress are reported in the literature, beginning as early as dental school and vocational training.
- On entering general dental practice, the number and variety of organisational and individual stressors can often grow. Clinicians may experience numerous work-places, financial, practice management and societal issues for which they often are unprepared.
- For some dentists, these issues may significantly affect their physical health or mental health, or both.
- Dentists may be embarrassed by the thought of seeking professional help, due to the challenges of stigma and the dynamics of their professional role.
- The principal preventative and treatment interventions focus on the inclusion of stress management and personal and professional awareness training in the undergraduate curriculum.
- Dental associations could also offer stress management workshops, professional help, counselling services and support networks.
- Stress management workshops focusing on stress relief could also be helpful.
- Clinical disorders such as burnout and depression may develop as a result of chronic long term occupational stress.
- Measurement of burnout in current scientific research is usually carried out using the Maslach Burnout Inventory as described by Maslach and Jackson (1997). The literature describes this as the most appropriate instrument to measure burnout.
- Risk factors for burnout include organisational causes of aspects of dental practice, such as time pressures, patient-related problems and management of auxiliary staff, as well as individual causes such as gender, clinical specialty area and ability to cope. However, interestingly, lack of career perspective has been reported as a crucial factor in the development of burnout.
- The literature reveals that depressive disorders are observed frequently in dentists.
- It is reported that, as a profession, dentists show high rates of suicide providing some objective evidence of high levels of psychological distress.
- A wide range of studies exist which investigate the prevalence and causes of workplace-related illnesses, as well as suggested primary care and dental school based interventions.
- Generally, the vast majority of workplace related illness studies are small, cross-sectional, self-reported and perhaps prone to bias.
- Areas for future research include investigating:
  - causes of stress, burnout and depression in general dental practitioners
  - impact of stress, burnout and depression upon performance
  - relationship between alcohol abuse and stress
  - pressures faced by new graduates
  - coping strategies for stress
  - monitoring levels of burnout risk
  - gender related differences in dentist burnout
  - depressive disorders and possible associations with gender, burnout, dental speciality and suicide
  - incidence rates and prevention of suicides in dentists
  - how to encourage clinicians to seek professional help with regards to drug / alcohol misuse and mental health issues.
References


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Section 6: Smoking, and drug and alcohol misuse in dentistry

Search terms
The search terms used in this domain are listed in Table 9.

Table 9. Search terms used to investigate smoking, and drug and alcohol misuse in dentistry

<table>
<thead>
<tr>
<th>Domain</th>
<th>Search Terms Used</th>
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<tr>
<td>Smoking, and drug and alcohol misuse in dentistry</td>
<td>Drug, substance misuse</td>
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<td>Smoking</td>
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<td>Alcoholism in dentistry</td>
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<td>Workload</td>
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<td>Dentist drug misuse and performance</td>
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Introduction
This section reviews the prevalence of smoking, alcohol and drug misuse in both dental students and dentists. Risk factors for the development of such problems are also explored. In addition, treatment interventions are considered, including the role of educational institutions, support organisations and specialist services in educating, monitoring and encouraging dentists to voluntarily receive treatment. The section concludes with suggested areas for further research.

Defining alcohol and drug misuse
The Department of Health (2001) defines drug misuse in taking alcohol and other drugs out of the NHS workplace as: “the use of illegal drugs and the misuse, whether deliberate or unintentional, of other drugs including alcohol and substances such as solvents”.

Misuse is described to cover three main areas:

- Inappropriate use, where use may aggravate an existing condition or situation, or is done in potentially dangerous or inappropriate circumstances
- Habitual use, where the individual becomes dependent on the effects of the substance to the extent that the desire for these effects becomes a dominant concern in their lives, to the detriment of other aspects of their lives
- Excessive use, which can lead to physical and mental illness, or antisocial behaviour.

The impact of alcohol and drug misuse
Drug and alcohol use and misuse can have a detrimental effect on performance at work, reducing the service provided to patients and the individual’s capacity to work safely. It can harm the misuser both physically and mentally and, through the misuser’s actions, other people and the environment (Department of Health 2001).

Such activities may also result in criminal prosecution with obvious repercussions for professional status. The GDC’s ethical guidance Standards for Dental Professionals (GDC 2005), replaced Maintaining Standards (GDC 1997) in June 2005. Unlike Maintaining Standards, Standards for Dental Professionals does not specifically comment on alcohol and drug use and misuse. However, the GDC does expect “…all registrants to maintain appropriate standards of personal behaviour. This would include the use and misuse of alcohol and drugs. In addition, the GDC would remind all registrants of their professional obligation to put patients’ interests first and act to protect them”.

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Understanding the extent of the problem: Alcohol misuse

Levels of alcohol misuse at dental school and during Vocational Training

There is significant evidence to demonstrate that alcohol misuse amongst dentists can begin as early as dental school (Underwood and Fox 2000, Newbury-Birch et al. 2002, Underwood et al. 2010).


A cross-sectional study of dental students at one English university (Underwood and Fox 2000) reported excessive alcohol consumption among dental students. The results of the study indicated that of those who reported that they drank alcohol, 63 per cent of males and 42 per cent of females drank in excess of sensible weekly limits with 56 per cent of males and 58 per cent of females classified as ‘binge drinking’. A decade later, the same study was conducted on dental undergraduates at this university (Underwood et al. 2010). Dental students were reported to be significantly less likely to drink alcohol. If female, they were significantly less likely to overestimate the number of units of alcohol they could safely consume in a week. Male students who drank alcohol were considered significantly less likely to drink at a level of increased risk, but more likely to binge drink.

It is not clear whether or not the prevalence of excessive drinking in dental students alters with time as these individuals progress through their degree course and commence work as dentists. It could be assumed that the majority of excessive drinking occurs when dentists are at dental school, but results of a longitudinal study examining the changing patterns of alcohol use in a cohort of dental undergraduates at Newcastle University suggest that this is not necessarily the case (Newbury-Birch et al. 2002).

The results showed that the proportion of individuals drinking above the recommended weekly limits - 14 units or more for women and 21 units or more for men (British Medical Association 1995) - declined from 47 per cent as second year students, to 25 per cent as final year students, but then increased back to 41 per cent as qualified dentists. The authors stated that there was no reason to believe that the situation was any different in any other UK dental school.

However, these results are contrary to the findings of Underwood et al. (2003) who investigated the levels of alcohol consumption in UK vocational dental practitioners (VDPs). This study showed that their alcohol consumption was, on average, above sensible limits, and many were binge drinking to an extent that would cause health problems later on in life. However, the study reported that alcohol misuse then reduced at the end of the training year.

A later study undertaken by Underwood et al. (2007) demonstrated that alcohol consumption by vocational dental practitioners was still high, but had decreased since 2000. However, levels of binge drinking remained similar at 40 per cent.

Levels of alcohol misuse after Vocational Training

Health and well being studies have demonstrated significant levels of alcohol consumption in general dental practitioners, often strongly correlated to feelings of stress (Kay and Scarrott 1997, Gorter et al. 2000, Myers and Myers 2004, Kay and Lowe 2008).

In a study involving 1000 BDA members, Kay and Lowe (2008) reported a slight increase in the use of alcohol between dentists assessed both in 1996 and 2005. In 2005, six per cent of the respondents had a drink problem and nine per cent had alcoholic tendencies. A higher percentage of dentists reported a drink problem, and dentists seemed more likely to have alcoholic tendencies than they were ten years ago.

Myers and Myers (2004) investigated 2,441 GDPs in the UK and reported similar findings. Furthermore, health behaviours such as alcohol use were strongly associated with work stress. A study by Gorter et al. (2000) also reported dentists with high burnout risk had an increased alcohol intake when compared to dentists with low burnout risk. These results are mirrored in an earlier study.
by Kay and Scarrott (1997) where a strong correlation between alcohol consumption and feelings of stress was reported.

**Risk of alcohol misuse in the dental profession**

A study undertaken by Kenna and Wood (2005) found that contrary to previous speculation, there was little evidence from the prevalence data to suggest that dentists were at a greater risk of developing alcohol or other drug use problems than the general population.

Furthermore, a study carried out by Barber and Fairclough (2001) comparing tobacco, alcohol and drug use among dental and law undergraduates, found law students smoked more and used cannabis more frequently, with all other substances being used at a similar levels. Whether this pattern continues post-qualification is not known, but it would tend to suggest the dental profession is not exceptional in its members’ use of alcohol and illicit drugs.

**Understanding the extent of the problem: Drug misuse**

**Levels of illicit drug use at dental school and during Vocational Training**

Studies have demonstrated that use of illicit drugs, particularly cannabis, is widespread amongst university students (Ashton and Kamali 1995, Webb et al. 1996, Newbury-Birch et al. 2000, Underwood et al. 2010).

A cross-sectional study of dental students in the UK (Underwood and Fox 2000) reported that 55 per cent of students used cannabis at least once or twice since starting dental school, with eight per cent of males and six per cent of females reporting current regular use at least once a week. A study undertaken ten years later at the same university demonstrated that dental students were significantly less likely to use cannabis and amphetamines (Underwood et al. 2010). Reported illicit drug use was associated with alcohol drinking, and particularly with tobacco use.

However, similar to alcohol misuse, it is not clear whether the prevalence of substance misuse in dental students changes with time. The results of a longitudinal study undertaken in Newcastle Dental School demonstrated that experimentation with illicit drugs including cannabis, heroin and ecstasy ranged from 47 per cent as second year students to 54 per cent as final year students and to 51 per cent as dentists. Current drug use for dentists, as opposed to experimentation, was reported by 16 per cent for cannabis; 13 per cent for cocaine/crack and 13 per cent for ecstasy. The authors stated that there was no reason to believe that the situation was any different in any other UK dental school (Newbury-Birch et al. 2002).

This study mirrors the findings of Underwood et al. (2003) who investigated the levels of illicit drug use in UK VDPs. The study showed that VDPs were indulging in drug use to a level that would cause health problems later on in life. However, the study reported that use of all substances had reduced post qualification.

A later study undertaken by Underwood et al. (2007) demonstrated that the level of illicit drug use (excluding cannabis) among VDPs had decreased since 2000, but levels of cannabis use remained similar. Cannabis was still the most popular illicit drug used by VDPs in 2005, as it was in 2000.

**Understanding the extent of the problem: Smoking**

**Levels of smoking at dental school and during Vocational Training**

Statistics on Smoking, England 2009 (NHS information Centre, 2009) reported that in 2007, 21 per cent of adults aged 16 and over in England stated that they smoked, compared with 22 per cent in 2006 and 39 per cent in 1980. As with previous years men are more likely to smoke than women (22 per cent compared with 19 per cent). Those aged 20 to 24 years and 25 to 34 years reported the highest prevalence of cigarette smoking (32 per cent and 26 per cent respectively). Generally speaking, the majority of VDPs are in this age group. However, reassuringly, the literature generally shows that smoking amongst dental students is less common than the general population (Underwood et al. 2007).
More specifically, the results of a longitudinal study investigating a cohort of dental students in Newcastle, revealed that the prevalence of smoking did not change at three time-points (1995, 1998 and 1999). The overall prevalence of smoking in the dental student group was still lower than that among the equivalent young and professional people in the general population at the time (Newbury-Birch et al. 2002 cited Office for National Statistics, 1998). A recent cross-sectional study demonstrated that female dental undergraduates at one English university in 2008, when compared to those in 1998, are reported to be significantly less likely to smoke tobacco (Underwood et al. 2010).

Similarly, a longitudinal study investigating the level of tobacco use among VDPs found that the reported use of tobacco by VDPs was less in 2005 than 2000, particularly among males (Underwood et al. 2007). This downward trend, mirrored in the general population, (Office for National Statistics 2006) is encouraging.

**Levels of smoking after Vocational Training**

Kay and Lowe (2008) investigated the self-perceived health and health-related behaviours of 1000 dentists and reported that very few respondents used tobacco (four per cent daily and four per cent occasionally) and most (59 per cent) said that only a few of their friends smoked: 36 per cent had no tobacco-using friends. Similarly, Myers and Myers (2004) found that less than 10 per cent of dentists smoked.

These findings in the UK are similar to those abroad. Gorter et al. (2000) reported that in a study in the Netherlands, investigating 709 actively practising dentists, 72 per cent of dentists did not smoke, 12 per cent smoked occasionally, and 16 per cent smoked daily. It was noted by the authors that this percentage was lower than that of the corresponding age reported nationally, showing that dentists were less likely to smoke than the general population (Gorter et al. 2000 citing Jaarboek 1998). Lennon (2002) identified how the relatively low levels of tobacco smoking among dentists and dental students are a positive finding. Firstly, because young graduates may be more likely to pursue non-smoking strategies in their own practices and secondly because it re-emphasises the findings of Doll et al. (1994) that professionals can change their behaviour and adopt more healthy life styles.

**Preventative and treatment interventions for alcohol and drug misuse**

Heavy drinking and illicit drug use are considered to be fully embedded in the youth culture today and it appears from this review that dental students are no exception to this. With the ‘pub crawl’ being viewed as an accepted cultural leisure activity, and young women an increasing target of alcohol marketing, only time will tell if the trend of increasing alcohol consumption as found in the general population (NHS Information Centre, Statistics on Alcohol 2009) will continue. However, it is clear that the excessive drinking and the use of illicit drugs in young dentists raises concerns, not only for their own health and well being, but also for the safety of patients who are under their care.

Newbury-Birch et al. (2002) concluded that the dental profession has long been reluctant to acknowledge the existence of alcohol and drug abuse amongst dentists. Furthermore, there are no signs to indicate that the current excessive drinking and the use of illicit drugs among students and young dentists are declining.

In view of health risks associated with excessive drinking, smoking, and substance misuse, Lavine et al. (2004), suggested that dental societies are in an ideal position to provide resources and support for dentists addictive disorders. A number of support organisations exist. Admittedly, most are for doctors, but a number span both professional groups, and a few cover other professions. Two organisations which support dentists are described below.

**Dentists Health Support Programme**

In the UK, the Sick Dentists Trust, currently known as the Dentists Health Support Programme, established in 1991, helps members of the dental profession with all matters relating to health, including mental and physical health and drug and alcohol abuse (Dentists’ Health Support Programme 2010).
Practitioner Health Programme

The Practitioner Health Programme (PHP) operates in London. This is a free, confidential service for doctors and dentists who have mental or physical health concerns and/or addiction problems and who live or work in the London area. It was set up in response to recommendations from public enquiries that a new service was required to support the health of practitioners. The service was formally launched in November 2008 (PHP 2010).

Any medical or dental practitioner (living or working in the London area) can use the service, where they have a mental health or addiction concern (at any level of severity) and/or a physical health concern (where that concern may impact on the practitioner’s performance).

However, despite the obvious benefits offered by these organisations, Lavine et al. (2004) described how dentists may still find it challenging to access care. Dentists have undergone a powerful process of socialisation into their professional role that can make it difficult to seek help for themselves. The authors outline how stigma about addictive and psychiatric illnesses continues to be a problem despite significant advances in scientific understanding of these disorders. Many people, especially those in positions of community visibility as dentists are, still struggle with shame when they associate problems with personal failure.

Newbury-Birch et al. (2002) suggest that dental professional bodies could take a more proactive role in minimising alcohol and illicit drug use by its members, by introducing random alcohol and drug testing in the workplace. The authors also advocate further health education measures at universities. This is suggested by Underwood et al. (2000) who recommend that education about smoking, alcohol and illicit drugs should be incorporated in a wider personal, health and social education programme, commencing in the first year as a dental undergraduate and updated throughout a dentist’s professional career.

Building on recommendations from Newbury-Birch et al. (2002), Lennon (2002) recommended transparent and regular random alcohol and drug testing within dental schools with the aim of minimising alcohol and illicit drug use by students.

However, Underwood et al. (2007) noted that VDP’s alcohol consumption reported ‘last week’ tended to be higher than that reported during an ‘average week’. This suggests that VDPs underestimate the actual amount of alcohol they consume. This has implications as to how undergraduates and VDPs should be educated about safe drinking limits.

A strong association between illicit drug use and those reporting tobacco and alcohol use was found by Underwood et al. (2007). This may suggest that targeted advice could be given to those who use tobacco and alcohol on harm reduction methods when using illicit drugs.

Areas for future research

The research on misuse of drugs and alcohol is relatively sparse and the role they play is thus unclear. More information is required about the prevalence of alcohol misuse in the profession, the factors that cause or sustain it and the impact upon clinical performance and patient care. The relative risks of developing addiction problems also need further clarification. Studies investigating levels of alcohol consumption in young dentists only focus on vocational trainees. Future research could investigate levels of alcohol consumption in foundation trainees over a two year period, in addition to vocational trainees.

Additional work is required to assess the impact of education and raising the awareness of dentists’ vulnerabilities to the misuse of alcohol and substances. This would inform further specialised programmes. Research to inform the process and implementation of specialised services would also be particularly useful. Attitudes to drug and alcohol testing in educational establishments and in the workplace, linked to treatment and rehabilitation programmes should also be explored.

Lennon (2002) identified an important research priority could be to follow young dental graduates for another four to five years post qualification, to re-examine levels of alcohol and drug misuse at a stage
when the realities of life, including mortgages and young families, may start to moderate their behaviour.

**Conclusion**

- Prevalence studies seem to demonstrate relatively high rates of alcohol and substance misuse amongst dentists, especially younger dentists, and dental students.
- Studies show that dental students appear to be drinking above the recommended levels of alcohol at university, and often engaging in “binge drinking” activities. However, the evidence examining behaviour during the transition phase of vocational training is not as clear.
- Health and well being studies have demonstrated significant levels of alcohol consumption in general dental practitioners, often strongly correlated to feelings of stress.
- The literature reveals that dental students seem to be indulging in drug use, including cannabis, heroin and ecstasy, to a level that would cause health problems later on in life. Cannabis appears still to be a very popular illicit drug used by VDPs, but the recent reclassification of cannabis from a class B to a class C drug may alter this trend.
- It is not clear whether the prevalence of substance misuse in dental students changes with time, particularly during the transitional year of vocation training.
- There is little evidence from the prevalence data to suggest that dentists were at a greater risk of developing alcohol or other drug use problems than the general population.
- Generally dentists appear to be smoking less than the equivalent cohort (age, sex) in the general population and the reduction in the numbers of dentists smoking mirrors the reduction in the general population trend.
- Low numbers of qualified dentists appear to be smoking post vocational training. The findings in the UK are similar to those found in the Netherlands.
- It is reported that the culture of the profession may make dentists a vulnerable group for alcohol and substance abuse. Factors such as denial and stigma may impede early detection.
- The principal interventions described in the literature involve educational institutions and support organisations in educating, monitoring and encouraging dentists to receive treatment voluntarily. However, specialised services for addicted dentists may well be the way forward.
- Areas for future research include:
  - the prevalence of alcohol and drug misuse among dentists, including vocational trainees and foundation trainees, and dental care professionals
  - the factors that cause or sustain alcohol and drug misuse, and the impact upon clinical performance and patient care
  - the process and implementation of specialised services
  - the impact of education and specialised programmes in managing addiction
  - the relative risks of developing addiction problems
  - attitudes to drug and alcohol testing in educational establishments and in the workplace, linked to treatment and rehabilitation programmes.
References


Section 7: Psychological factors related to performance

Search terms
The search terms used in this domain are listed in Table 10.

Table 10. Search terms used to investigate psychological factors related to performance

<table>
<thead>
<tr>
<th>Domain</th>
<th>Search Terms Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are psychological factors related to</td>
<td>Culture</td>
</tr>
<tr>
<td>performance?</td>
<td>Psychological factors</td>
</tr>
<tr>
<td></td>
<td>Performance of dentists</td>
</tr>
<tr>
<td></td>
<td>Personality</td>
</tr>
<tr>
<td></td>
<td>Values</td>
</tr>
<tr>
<td></td>
<td>Interpersonal skills</td>
</tr>
<tr>
<td></td>
<td>Behavioural issues</td>
</tr>
<tr>
<td></td>
<td>Workload</td>
</tr>
<tr>
<td></td>
<td>Personal attributes</td>
</tr>
<tr>
<td></td>
<td>Job satisfaction</td>
</tr>
<tr>
<td></td>
<td>Dentist clinical errors</td>
</tr>
</tbody>
</table>

Introduction
This section considers the potential effects of different personality types, as well as different psychological factors, upon dentist performance. Initially, findings from NCAS Casework: The first eight years, are reviewed to demonstrate the nature of the behavioural aspects of performance concerns of those practitioners referred to NCAS. An overview is then given of dentists’ general personality type, as defined by the “Five-Factor Model” and the “Myers-Briggs Personality Type Indicator test”. The latest results from an ongoing study currently being undertaken by NCAS are also considered. The work aims to identify a normative personality profile for dentists in the UK and uses the Hogan Development Survey and the Neuroticism-Extroversion-Openness Personality Inventory (NEO-PI) questionnaire as part of the behavioural component of the assessment (NCAS 2009). Attitudes and values inherent to dentists are then explored, in addition to other psychological factors including: engagement, job satisfaction, communication, entrepreneurship, autonomy and the psychological impact of failure on the dentist and dental team. The differences in personality between male and female dentists are finally considered. The section concludes with recommendations for further research on this topic.

Findings from NCAS Casework: The first eight years (NCAS 2009)
In order to understand the psychological factors that can impact upon performance, it is important to examine the nature of the performance concerns of those practitioners referred to NCAS. The findings from NCAS Casework: The first eight years, (2009) are as follows.

Between December 2007 and March 2009, 1,472 dental, surgical and other medical cases were referred to, and were handled by NCAS (Figure 9). It is important to note that of the batch of 1,472 cases described here in Figure 9, and later in Table 11, 23 per cent are open cases and 77 per cent are closed, so these analyses may not show a final picture of concerns. The batch is considered reasonably representative of casework generally, with 61 per cent of the closed batch being ‘advice-only’ cases.
The pattern of concerns logged about dental cases matches quite closely the pattern for medical cases, at broad concern category level. It appears however, that behavioural concerns are less common amongst dentists (18 per cent) in comparison to other case groups (total for all case groups was 29 per cent).

There is a broad range of sub-concerns within the ‘behavioural difficulties other than misconduct’, concern group (Table 11). The first percentage column shows the proportion of cases with each sub-concern amongst the 1,472 cases examined. The second percentage column shows the proportion of cases within the concern group having each sub-concern.

Table 11: Detailed concerns amongst 1,472 cases

<table>
<thead>
<tr>
<th>Concerns Group</th>
<th>Sub-concern</th>
<th>% of all 1,472 cases</th>
<th>Of cases within group, % with each sub-concern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavioural difficulties other than misconduct (29% of all cases)</td>
<td>Communication with colleagues</td>
<td>20</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>Team working</td>
<td>15</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>Communication with management</td>
<td>12</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Communication with patients, carers, relatives</td>
<td>12</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Aggressive behaviour</td>
<td>8</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Behaviour under pressure</td>
<td>7</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Conflict management style</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>Leadership style</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Decision making style</td>
<td>4</td>
<td>15</td>
</tr>
</tbody>
</table>
How can a dentist’s personality affect performance?

Personality can strongly impact on the performance of a dentist. Even though personality could be considered an inherent trait of an individual, personality types are attracted to certain work environments that are compatible to their own values and interests (Holland 1997).

The Five-Factor Model of Personality

The Five-Factor Model of personality, commonly referred to colloquially, as the “Big Five,” is a popular taxonomy used to classify personality traits into an understandable structure. The model describes the most salient aspects of personality. The five factors are:

- Extroversion: the quantity and intensity of interpersonal interaction
- Conscientiousness: the amount of persistence, organisation, and motivation in goal-directed behaviours
- Neuroticism: the tendency to experience negative effect, such as anxiety, depression, and hostility (this factor is often termed “Emotional Stability” when used in work settings
- Openness to Experience: the proactive seeking and appreciation of new experiences
- Agreeableness: the quality of one’s interpersonal interactions along a continuum from compassion to antagonism.

Chamberlain et al. (2005) used this model to investigate the extent to which dental students’ performance in dental school is influenced by their personalities. The aim was to examine the use of personality measures to predict the success of dental students in clinical and academic courses, and to compare their personality profiles to those of dental practitioners. The assessment correlated positively with Conscientiousness, and negatively with Neuroticism, suggesting that these two personality elements are both major factors which influence a dental student’s professional behaviour. Students who scored highly in conscientiousness assessments were deemed more likely to perform better in both their clinical and academic courses, and to receive higher scores in professionalism. Students who demonstrated an absence of neuroticism and were more emotionally stable, scored higher in terms of their perceived professionalism. The lack of neuroticism, thus appears to be an important predictor of professional behaviour. These are important factors to consider due to the indirect impact upon performance.

The Revised Neuroticism-Extroversion-Openness Personality Inventory (NEO PI-R) questionnaire

The NEO PI-R personality questionnaire (Costa and McCrae 1992) measures five broad aspects of typical personality, derived from the Five Factor Model of personality: emotional stability; extraversion; openness; agreeableness and conscientiousness. Scores are derived from answers to a 240 item questionnaire and are profiled against these facets and domains.

Myers-Briggs Type Indicator Test

The Myers-Briggs Type Indicator is a well known psychological test used in organisations worldwide. This approach categorises individuals into 16 type combinations based on high or low preferences across the following four dimensions:

- Extroversion vs. Introversion
- Sensing vs. Intuition
- Thinking vs. Feeling
- Judgment vs. Perception.

David (2001) found that both dentists and dental students generally scored high on sensing and judging, using the Myers-Briggs Type Indicator test. Dentists in the study preferred to view their
environment through their own lenses or categories, rather than simply accepting the world as it presents itself. They structured the world in order to avoid ambiguity. As “judges” dentists appeared to evaluate what was presented to them, determining its utility rather than letting things stand in their own contexts. Typically, these tendencies can become more pronounced during dental education and into practice (Mc Daniel et al. 1985). A second pattern that David (2001) identified was a preference for the “concrete” over the theoretical. Dentists were described as realists who favoured the practical, objective, certain, and definite.

**Hogan Development Survey**

The Hogan Development Survey (Hogan and Hogan 1997) identified behaviours which can become dysfunctional (overplayed) when the individual is under stress or pressure. It is a measure derived from the Fourth Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) classification of personality disorders, but adapted by Hogan for use in occupational settings.

**Findings from NCAS**

NCAS is currently in the process of undertaking a study to identify a normative personality profile for dentists in the UK (NCAS 2009). This will provide a comparative group against which to assess dentists who have had concerns expressed about their performance resulting in their referral to NCAS. The latest results are considered in the following paragraphs.

**Background to the study**

Since the introduction of the behavioural assessment into the NCAS assessment process, there has been increasing interest in the personality profiles of both doctors and dentists referred to NCAS. There is now a substantial body of evidence highlighting the important influence of personality and psychological factors on doctors’ performance (Firth-Cozens and King 2006). Much less work of this nature has been carried out with dentists and NCAS currently has very little personality data on this group as the numbers so far assessed in the service are very low. However, the same behavioural issues with doctors seem likely to arise with dentists referred to NCAS.

Initial analyses have been carried out on data from 120 behavioural assessments of doctors, to try to identify any predominant personality traits or patterns of traits. Drawing any meaningful conclusions from this work will become easier once there is a relevant comparison or norm group of doctors within the general population who have not been referred to NCAS. Research to compile this norm base for doctors is underway.

**Methodology**

A sample of 100 UK dental practitioners was recruited. This sample is not considered representative of the total UK dentist population, but the number was considered sufficient as a minimum norm base against which to compare the personality profiles of dental practitioners referred to NCAS.

The vast majority of cases in the sample (83 per cent) were white British and (94 per cent) UK qualified, making comparisons between different places of qualification or ethnic groups invalid due to the small sample sizes of the sub-groups.

A further study has been completed taking the volunteer sample size to 219 and it is expected that this work will be published during 2011.

**The personality measures**

The psychometric measures used as part of the NCAS behavioural assessment of dentists (as well as doctors) include two personality tests. The first is the NEO PI-R personality questionnaire (Costa and McCrae 1992), which measures five broad aspects of typical personality. Currently, the relevant validated comparison or norm group for the NEO profiles is based on data from the UK working population. This norm group is made up of 1301 individuals. The second is the Hogan Development Survey (Hogan and Hogan 1998) which identifies behaviours which can become dysfunctional...
Findings

Given the very small sample sizes in each of the sub-groups, it is not yet possible to draw definitive conclusions about dentists’ personalities in general, or about comparisons between sub-groups (e.g. between place of qualification, ethnic groups or area of practice). Gender differences and some differences between dentists according to their area of practice have been identified, but results should be interpreted with caution given the relatively small sample sizes which considerably limits the generalisation to the dental population of the UK.

NEO PI-R: General personality traits of the total sample of 100 dentists

**Emotional reactivity**

A total of 59 per cent of the sample scored high, or very high, compared with the general working population, on emotional reactivity, suggesting that these dentists are more susceptible and reactive to stress than most people. Within this domain over 60 per cent of the sample reported experiencing greater anxiety, feelings of despondency, sadness and vulnerability (feeling panicky under pressure) than most people. 40 per cent of the sample reported feeling less optimistic than most people in the population and 48 per cent reported lower levels of assertiveness than most people.

40 per cent of female dentists scored very much higher than the general population on emotional reactivity, i.e. much more prone to stress, compared with only 18 per cent of males scoring themselves very high in this domain (not tested for statistical significance).

**Agreeableness**

39 per cent of the population scored high or very high on agreeableness, indicating a tendency to be more positive and collaborative with others than the general population. Within this domain, 56 per cent of this group indicated that they were more compassionate than most people.

18 per cent of females indicated a lower or very much lower level of agreeableness than the general population, compared with 31 per cent of males (not tested for statistical significance). This may reflect a general cultural norm that females tend to be more sympathetic than males.

Comparing NEO profiles between dentists in different areas of practice, independent contractors (GDPs) scored more frequently for very high angry hostility (45 per cent) and vulnerability (55 per cent) than dentists from other areas of practice. However the number in this group is small (11) and therefore these results are not necessarily applicable to all dentists in this area of practice. The higher levels of angry hostility and vulnerability in this sub-group could be explained either by “trait” i.e. they are a naturally anxious group and/or by “stat” i.e. being in independent practice is causing or contributing to greater feelings of hostility and vulnerability because there is perhaps less job security. However, before any conclusions can be drawn, the sample size needs to be increased to see if the pattern of traits persists.

Hogan Development Survey (HDS): How dentists work under pressure

Of the total sample of 98 dentists who completed this questionnaire, 39 per cent scored very high on the diligent-perfectionist scale; i.e. they showed a much greater tendency than most people to be perfectionist under pressure. 36 per cent scored very high on the focussed-passive-aggressive scale; i.e. a stronger tendency to stick to their own agenda when under pressure and to resist attempts to help or offer advice and feedback. There was little difference between males and females on this trait.

However, 37 per cent of female dentists showed a stronger tendency to become more cautious under pressure, compared with 19 per cent of males scoring high in this area. Females appeared slightly more inclined to give a socially desirable response to the questionnaire (i.e. to try to present themselves in a favourable light). In this particular test, this response pattern has the effect of slightly
exaggerating the score on the negative tendencies. If this response pattern generalises to the wider female dentist population, it may cast some doubt on the overall validity of their responses.

In this study group male dentists were more likely to display detachment (scoring higher on the independent-detached scale) than female dentists – i.e. they withdrew from others when under pressure and could be difficult to communicate with. No other significant patterns of differences were identified from this sample of 98.

**How dentists compare to other groups: UK working population norms and the Edgecumbe corporate norms**

Most of the dentist population scored within the same ranges as the total UK sample, with the exception of emotional reactivity, where most of the dentists scored between average and very high.

The NEO results for dentists were also compared to the Edgecumbe (2005) corporate sample (N=538) to ensure the dentist sample was compared to UK professionals. This analysis has returned fairly similar outcomes to the comparison to the UK sample, with the only difference of the emotional reactivity results being slightly lower, although still ranging from average to very high.

In most areas of the HDS test, most of dentists scored in the same ranges as the total UK sample, with the only exceptions in:

- Diligent-Perfectionist, where most of dentists scored low to very high (most of total UK sample scored between low and high)
- Charming-Manipulative, where most of dentists scored low to elevated (most of total UK sample scored between low and high)
- Shrewd-Mistrustful, where most of dentists scored low (most of total UK sample score between low and elevated).

**Moving forward**

Using the results of this analysis, NCAS has created a profile sheet for NEO PI-R which enables the plotting of an individual dentist’s NEO scores against the norms of other dentists in the UK. This can be used in future by NCAS as part of a behavioural assessment for a dentist in difficulty.

The longer term aim is to ensure that the final norm group represents all relevant dental specialties in appropriate proportions.

**How can competence influence a dentist’s performance?**

**Competence, attitudes and values**

Competence, the ability to complete a task to a pre-determined standard, is being increasingly assessed in a range of professions and occupations. In both medicine and dentistry, the need for rigorous and objective assessments is heightened by the move towards greater accountability and revalidation (Evans 2001). In the First Five Years, (GDC 1997) competencies in dentistry are broken down to a series of desirable attributes:

- Knowledge of appropriate sorts
- Skills
- Attitudes.

In this discussion, attitudes and values are considered as psychological factors which have the potential to affect the performance of a dentist.
Attitudes

Attitudes are usually described as being in the ‘affective domain’, and are based on complex sets of values and beliefs. These are acquired throughout life and are based on a wide range of external influences (Gatrell and White 1999).

General parallels can be made between the attitudes of doctors and dentists. De Monchy et al. (1988) described the professional attitude of doctors to constitute feelings, beliefs and behaviour towards patients, as well as other factors such as health care delivery, scientific interest and collaboration with other health professionals. These could be considered equally applicable for dentists.

In dentistry, attitude could be broken down into a number of discrete areas which include the following (Evans 2001):

- Clinical judgement
- Interaction with patients and relatives
- Ethics
- Reliability
- Professional development
- Team work
- Image or personal appearance.

Each of these areas could significantly impact upon the performance of a dentist. However, certain attitudes can also have a negative impact upon performance. As described in Section 5, a negative attitude towards patients, mental or emotional exhaustion and the tendency to evaluate oneself negatively are factors associated with burnout among dentists (Maslach et al. 1996).

Values

Core values can be described as critical and relatively unchanging determinants of the way that people behave. Individuals tend not to consider them a great deal, and then only at those times when they are questioned, or challenged in some fundamental way (Newsome 2003). Shalom (1987) defined values as a belief that transcends specific situations and guides the selection of behaviour. The author described how the way that individuals behave will vary according to the nature and strength of their basic core values. Therefore the way the dental team interacts, with each other, as well as with patients, can be dependent on these core values. For example, teams who share values tend to be stronger, more unified, more highly motivated and ultimately more productive, than groups of people who do not share them. As described in Section 9, the collective core values of an organisation constitutes the ‘culture’ of that organisation, and includes set values, ideals, attitudes, beliefs and behaviours which influence how people work together (Newsome 2003). Such factors can indirectly influence the performance of a dentist.

Newsome (2003) also explained that a dental practice with defined and known core values could be more successful long term. This is due to:

- patients’ evaluation of a dental practice are generally more focused on those ‘softer’ aspects of care (that they understand and feel competent to evaluate), than on the ‘hard’ technical skills of the dentist
- the dental team and the high level of engagement with the dental practice
- core values and ideologies are clearly stated, staff feel in tune with these values and feel highly motivated to act upon them
- a team comprising of highly motivated staff members, dedicated to providing the best in customer care is likely to be evaluated positively by the patient.
Other psychological factors and personality traits that can impact upon performance

Engagement

Engagement has been defined by three core dimensions: vigour, dedication, and absorption (Schaufeli et al. 2002). Vigour is characterised by high levels of energy and mental resilience while working, the willingness to invest efforts in one’s work, and persistence even in the face of difficulties. Dedication constitutes a sense of significance, enthusiasm, inspiration, pride, and challenge. Absorption comprises of being fully focussed and engrossed in one’s work, where time can pass by quickly, and one has difficulties with detaching oneself from work.

These traits can impact upon the performance of a dentist and are worth considering. In a study investigating engagement in dentists, Gorter et al. (2008) demonstrated that levels of vigour among dentists were the same as other professional groups. Levels of dedication and absorption, however, were higher than expected. Maslach and Leiter (1997) proposed that high levels of work engagement are characterised by motivation, energy, and involvement of the dental team, and results in efficacy of work processes. Engaged employees are dynamic and see themselves as fully able to manage the demands of their job. These are factors which can all impact upon the performance of a dentist.

Job resources also need to be considered here. These are aspects of a job that can positively influence one’s well being at work, which could also then impact upon performance. It has been suggested that job resources relate positively to job engagement (Gorter et al. 2008). Certain aspects of a dentists’ working environment could impact upon levels of engagement, in particular dentists’ idealism, and the pride they feel about their profession, patient care, professional contacts, level of technical skill, and outcomes of care for long term patients. This association is discussed in greater detail in Section 9, the impact of work-related factors upon performance.

Job satisfaction

Job satisfaction can significantly impact upon performance. In general terms, job satisfaction can be defined as an individual’s general attitude toward his or her job. It is directly related to the attitudes, values and personality inherent to a dentist and it can thus influence the working patterns. Furthermore, it has been found that a person with a high level of job satisfaction may invariably have positive attitudes toward their job, whilst a person who is dissatisfied may have negative attitudes about their job (Robbins 1998). Cameron (1973) explained that job satisfaction is therefore not a single entity, but a complex set of interrelationships of tasks, roles, responsibilities, interactions, incentives and rewards.

Job satisfaction has also been recognised as a key factor determining productivity, as summarised by the statement ‘a satisfied worker is a good worker’ (Robbins 1998). Job satisfaction is also highly correlated to levels of staff turnover and absenteeism (Harris et al. 2008).

Communication skills

Poor communication skills, or a lack of proper communication, can impact significantly on the performance of a dentist, and these factors are often key drivers in many complaints and claims (Tiernan 2006). The same author described how communication and customer care skills can often have a major impact on the likelihood of a patient making a complaint, or claim, if something goes wrong. Furthermore, good communication skills may encourage or make it easier for patients to provide constructive feedback about the services provided.

Gender differences have been a particular focus within communication research. Both in verbal and nonverbal behaviour, men and women tend to show differences in the way they communicate. This is explored in greater detail in Sections 3 and 10 of this review. Women, more than men, are likely to engage in a communication style that is characterised by: a symmetrical equal communication pattern; striving to obtain cooperation; a focus on the emotions and feelings of their conversation partner; exchanging recognition of these feelings; creating harmony and equality. Men, on the other hand, are likely to engage in a style that is characterised by communicating asymmetrically, providing
Entrepreneurship

Entrepreneurship has been identified as a key personality trait in both male and female dentists (Gorter et al. 2006). In both genders, aspects, such as building up a practice, working independently and being one’s own boss are highly valued.

Autonomy

Harris et al. (2009) found that the feeling of being in control of one’s work is considered to be very important by some practitioners. Interestingly, GDS practitioners working in mixed NHS/private practices were found to value professional autonomy more highly than other groups. This value may vary with the outlook of the individual and for some practitioners, having control at work can be a key job characteristic which satisfies higher needs and contributes to job satisfaction (Cooper 1976). However, it has been suggested that professional autonomy may not vary according to the gender of the dentist Van der Sanden et al. (2003).

It is worth noting that in exploring values of power, leadership, independence and autonomy, conflicting findings have been found David (2001). Generally, the value of power is rated high by dentists, while conversely leadership is rated low. Independence is sometimes rated high while autonomy is rated low. This tendency may be related to the need for power that dentists have, but not a need for exercising that power through general actions. Similarly, independence may be a real need, but one that is circumscribed to specific locations or circumstances.

The psychological impact of failure on the dentist and dental team

Due to the scientific nature of dentistry, outcomes can be quite clearly defined as successful or a failure. Therefore the attitude towards failure and its potential impact upon performance needs to be considered. Newton (2007) suggests that generally, the psychological impact of failure is negative and linked to feelings of self-blame, lowered self esteem and often a breakdown in the patient-dentist relationship. This could have an indirect impact upon performance.

Newton uses an example from a study by Newton and Gibbons (1996) where one practitioner described a critical incident in his surgery: “the worst thing I had is a patient with an anaphylactic shock on me 12 to 18 months ago which was the most horrendous thing ever and so now every local I’m doing, I’m waiting for it to happen again and I’m living in fear basically”. Newton (2007) argues that this statement reveals three key irrational premises. The first is selective focus, where the practitioner is focusing on one negative incident out of many similar experiences that were positive or at least not eventful. Secondly, the event is becoming magnified, with the consequences of the incident continuing long beyond its immediate impact, in this example for 18 months. Thirdly, there is over-generalisation, where the clinician is anticipating that a similar incident will occur on every administration of local anaesthetic. Each of these three premises could therefore have the potential to impact upon performance, through a possible modification of behaviour in the long term.

Areas for future research

This review has suggested that further research is required to investigate the impact of psychological factors upon performance in dentistry.

Psychometric tests are now being used in the application process for entry to some dental schools, as part of the selection process. It could be useful to build the results of such tests into a longitudinal study which would assess changes in personality traits at different stages of a dentist’s career, and within different clinical settings/work environments/specialty areas. Given the close association between job satisfaction, engagement and burnout, it would be particularly important to monitor the development of such negative traits to allow instigation of interventional strategies should an individual be displaying traits which may predispose to stress and burnout. Based on the outcome of such work, it could be especially useful to build up a “personality profile” which is able to define the personality attributes of dentists who work successfully in different clinical settings/environments/specialities.
Dentists could then be given career advice and guidance depending on the outcome of their personality test.

NCAS has created a profile sheet for NEO PI-R which enables the plotting of an individual dentist’s NEO scores against the norms of other dentists in the UK. It is intended that this could be used by NCAS as part of a behavioural assessment for a dentist in difficulty. A further study has been completed taking the volunteer sample size to 219 and it is expected that this work will be published during 2011.

Given that the psychological impact of failure is generally negative and linked to feelings of self-blame, lowered self esteem and often a breakdown in the patient-dentist relationship, it could be argued that this could indirectly impact upon performance. An area of further research could thus focus on exploring the direct impact of failure upon clinical performance, with a focus on the effective management of negative feelings and generating learning outcomes.

**Conclusion**

- There are potentially important ways in which personality and other individual characteristics can affect the performance of dentists.
- Traits such as conscientiousness and agreeableness tend to be common in dentists. Dentists may also be more susceptible and reactive to stress than most people.
- As demonstrated by the Myers-Briggs Type Indicator test, dentists can be described as realists who favour the practical and definite. Sensing and judging traits are also common in dentists’ personalities.
- Dentists’ attitudes can impact upon their ability to complete a task to a pre-determined standard, both in a positive and negative sense.
- Core values can have a significant impact upon performance, both as an individual dentist, and within the dental team. In particular, the way that individuals behave will vary according to the nature and strength of their basic core values. When this is extended to the dental practice, a practice with defined and known core values will be more successful. Such benefits may indirectly impact upon the performance of a dentist.
- High levels of work engagement are deemed to improve productivity and efficacy of the dental team. Engaged employees have been described as dynamic, and see themselves as fully able to manage the demands of their job. Dentists’ idealism, and the pride they feel about their work, can also impact upon their levels of engagement.
- A person with a high level of job satisfaction may invariably hold positive attitudes towards their job, whilst a person who is dissatisfied may hold negative attitudes about their job. Job satisfaction is noted to determine productivity, staff turnover and absenteeism, and could also be related to stress and burnout.
- Both in verbal and non-verbal communication, men and women tend to show differences in the way they communicate. Communication skills can play a fundamental role in determining performance at work. Poor communication skills, or a lack of proper communication, can especially compromise performance, and these factors are often key drivers in many complaints and claims.
- Entrepreneurship has been identified as a key personality trait in both male and female dentists. Similarly, the feeling of being in control of one’s work, professional autonomy, is considered to be very important by some practitioners. However, this may vary according to clinical setting, work environment (NHS/private dentistry) and the outlook of the individual. It was found that professional autonomy did not necessarily vary with the gender of the dentist.
- Given that the psychological impact of failure is generally negative and linked to feelings of self-blame, lowered self esteem and often a breakdown in the patient-dentist relationship, it could be argued that this could indirectly impact upon performance in the long term.
- Areas for future research include:
  - understanding the impact of psychological factors upon performance
  - assessing changes in dentists’ personality traits at different career stages
- using personality profiling to develop interventional strategies and career advice programmes
- NCAS is undertaking a study to identify a normative personality profile for dentists in the UK. This report will be available in summer 2011. It will provide a comparative group against which to assess dentists who have had concerns expressed about their performance resulting in their referral to NCAS
- exploring the direct impact of failure upon clinical performance, with a focus on the effective management of negative feelings and generating learning outcomes.
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Section 8: The role of education and training

Search terms
The search terms used in this domain are listed in Table 12.

Table 12. Search terms used to investigate the role of education and training

<table>
<thead>
<tr>
<th>Domain</th>
<th>Search Terms Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>The role of education and training</td>
<td>Academic, Dentistry, Dental education, Undergraduate dental education, Postgraduate dental education, Continuing professional development in the UK, Statistics of dentists migrating to the UK, Dentists with special interests, Dental students, Post-qualification training, Vocational Training, Foundation Training, Place of qualification, Complaints in dentistry</td>
</tr>
</tbody>
</table>

Introduction
Designing dental education programmes is not a simple task. Scientific and technological developments in dental care, ongoing changes to the gender ratio, ethnicity and skill-mix of the dental workforce, and major changes in the policies regarding the provision of oral health care are all key factors that contribute to this challenge.

This section examines how educational factors can influence the performance of dentists. Firstly, it gives an overview of the role of dental undergraduate education in the UK, followed by an examination of what particular aspects of the curriculum can impact upon performance. The differences in undergraduate education across EEA member states and other countries are also examined.

Educational factors post-qualification are considered in terms of lifelong learning, continuing professional development and postgraduate qualifications. The benefits of vocational training and dental foundation training programmes are summarised, as well as the new career pathway for dentists with special interests (DwSI). In addition, the poor uptake of retraining courses for dentists returning back to clinical dentistry after a career break is discussed. Alongside formal education, the number of years of experience as a dental practitioner is examined, and how this can influence performance. The section concludes with recommendations for further research in this topic.

The role of undergraduate education
According to the GDC (GDC. The First Five Years 1997. Third Edition 2008) the purpose of undergraduate dental education is to produce a dentist who has demonstrated, upon graduation, that he or she has met the outcomes required for registration with the GDC, and then is consequently able to work as a dentist in the UK. In order to satisfy such requirements, dental schools are required to devise a curriculum covering the following aspects:

- Developments in oral health need and the role of dentists in promoting the health and well being of the public
- The significance of continuing professional development to keep their knowledge and skills up-to-date after graduation and throughout their professional lives
- The importance of dental team work, with opportunities for student dentists to train and to develop interpersonal skills with colleagues and other dental professionals
The development of an understanding of audit and clinical governance and their roles in ensuring a commitment by organisations and individuals in promoting the continuous development of quality in the delivery of patient care, including primary dental care and routine clinical practice.

The understanding of the relevance of evidence-based dentistry and how this relates to clinical practice.

The requirements of European Directives on dental training.

The need to ensure that patient feedback is incorporated into the curriculum – and acted upon.

The GDC also stipulates that dental schools must promote professionalism, ensuring that undergraduates go beyond just academic achievement, to incorporate the attitudes, values and behaviours to put patients’ interests first, and act to protect them at all times.

New graduates from UK dental schools are emerging into a profession at a time of unprecedented change. This is due to scientific and technological developments in dental care, the growing role of aesthetics in dental treatments, and major changes in the policies regarding the provision of oral health care (Gallagher et al. 2007). It is therefore a necessity that during their undergraduate education, dental schools prepare future dental professionals so that they are capable of confronting such changes.

Aspects of a dental school curriculum that could influence the performance of future dentists

Leadership skills

The growing importance of recognising the dentist as the leader of the dental team is well established in the literature (Department of Health 2006, Chilcutt 2009). Dental schools are considered well placed to deliver team work and leadership education including staff appraisal and conflict management (Gorter et al. 2005, Gorter et al. 2006, Victoroff et al. 2008, Victoroff et al. 2009). The curriculum of UK dental schools has recently been modified, changing the role of the dentist from the performer of all dental tasks, to the leader of the dental team (Department of Health 2006). Leadership skills are discussed in more detail in Section 10.

Communication skills

There is also evidence that the teaching of communication skills during undergraduate education is vital (Wagner et al. (2008). Education to improve communication in cross-cultural exchanges, in particular, has been recommended. Wagner and Redford-Badwal (2008) investigated 111 dental students from University of Connecticut, USA and demonstrated that most students appreciated the importance of a patient’s culture in the provision of dental care. However, it was found that many dentists graduate without any knowledge of the cultures of the patients they are likely to treat in practice. The authors concluded that teaching students about the patient groups they are likely to treat may not only improve knowledge of those groups, but may also have the potential to increase the use of culturally sensitive dental care practices. No examples were given of such practices.

In the University of Otago in New Zealand, Hannah et al. (2009), assessed 136 dental students participating in a consultation skills course, designed to improve the dentist’s communication skills. The study revealed that small group, skills-based courses were effective in teaching consultation skills to undergraduate dental students. There was also evidence to suggest that consultation skills training equipped students for the management of anxious patients, identification and rectification of ethical issues, and the recognition of certain psychosocial issues. Furthermore, it had the capacity to reduce any gender or ethnicity differences in communication skills.

Yoshida et al. (2002) suggested that dental schools should strive to build communication skills into the entire curriculum, gradually increasing student exposure to more and more complex issues. The authors also recommended that performance-based assessments should also be used more frequently.
The growing role of the dental team

The changing picture of oral disease is predicted to produce changing needs in terms of the skills deemed essential for future generations of dentists. One of the most fundamental developments over the last two to three years has been the rapid expansion of training for dental care professionals (DCPs). This expansion, coupled with the possible extension of clinical roles for DCPs (following on from registration) is expected to lead to a wider degree of skill mix in the provision of services. Dental undergraduate training will thus be fundamental in teaching leadership skills, as well as ensuring that dental students understand and appreciate the roles DCPs can play within the dental team (Department of Health 2006).

Does the country of qualification impact upon clinician performance?

As discussed in Section 3, the number of dentists currently working in the UK, from overseas and EEA member states (other than the UK), has increased significantly in the last few years (GDC 2010). In order to understand the clinical skills, knowledge, attitudes and working patterns of overseas/EEA qualified dentists, it is important to acknowledge that distinct differences exist between the curriculums of dental schools in these countries. Purely within Europe, for example, it has been demonstrated that the content, standards and outcomes of dental curriculums differ widely from one country to another. This is principally due to socio-political determinants, the national educational system, and the prevalence of disease (Bucur 2004).

Furthermore, Shanley et al. (1997) found that in 30 different dental schools across Europe, there were considerable differences in the number of hours devoted to various subjects, and that there was little evidence of convergence in the methods of assessment or quality assurance. The authors also showed that there were differences in resources, levels of staff, availability of clinical training places, and outputs from research and patient treatments.

The impact of the vocational training and dental foundation training programmes on clinician performance

The role of vocational training

Since 1993, vocational training (VT) in dentistry has been compulsory for UK dental graduates who wish to work in the primary care services of the NHS. It is normally undertaken during the first two years following graduation. During the VT year, on one day per week for 30 weeks, VDPs attend an educational day-release programme designed to develop the skills, knowledge and attitudes required to practise NHS dentistry (Allen 1993). As well as permitting a dentist to work in the NHS, VT provides a safety net, allowing trainees to experience primary care dentistry and consider their future career paths. This is considered an advantage for anyone wishing to work long term in general dental practice (Ibbetson 2003).

The role of the Dental Foundation Training Programme (DFTP)

A two year structured dental training programme has been recently introduced in the UK. This Dental Foundation Training Programme (DFTP) provides trainees with a wider range of opportunities to develop their communication, team working and clinical skills, in a variety of clinical settings; especially when compared to equivalent stand alone posts in each service. In particular, trainees have an opportunity to improve their patient management and time management skills. They have various opportunities to undertake research and will gain experience in problem solving and decision making (Department of Health 2006).

The principal benefits of a dental foundation programme have thus been summarised as follows (Department of Health 2003):

- Improved care for patients with a particular emphasis on safety and standards
- Improved training opportunities for the future workforce in the UK
- Flexible training pathways tailored to meet the needs of the service and personal development needs of young dental graduates
- Streamlined training to enable a greater proportion of care to be delivered by trained staff
- Improved recruitment and retention of the workforce in the UK.

As highlighted in *A Curriculum for UK Dental Foundation Programme Training* (Department of Health 2006) it is crucial to recognise that a dental undergraduate course will produce knowledgeable graduates, but with a limited skill set. The outcome achieved might essentially be that of a 'safe beginner'. Vocational training/foundation training programmes thus appear fundamental in developing the dental graduate into an all rounded and competent clinician (Department of Health 2006).

**Continuing professional development and lifelong learning for dental practitioners**

**Postgraduate education**

Based primarily on an apprenticeship model, postgraduate dental training (as with postgraduate medical training) places specific emphasis on experiential learning within the workplace, involving elements of coaching through appropriate supervision and mentorship, supplemented by formal educational events and self-directed learning. In addition, modern day-release training programmes have an increasing focus on learning within clinical teams, which bring into play socio-cultural learning theories (Bleakley 2009). Such learning comes under the umbrella of Continuing Professional Development (CPD) and lifelong learning, which are key components of the GDC's and Department of Health's strategy for enhancing clinical governance within the dental profession in the UK and ensuring the public's trust of its dentists (Buck and Newton 2002). As defined by the GDC all registered dentists must participate in CPD for 250 hours every five years, subdivided into 75 hours verifiable CPD, and 175 hours of general (informal) CPD. A dentist is required to keep a record of activity and certify compliance annually and certain core (compulsory) subjects must be included in the verifiable activity, including:

- medical emergencies (at least ten hours in every five year CPD cycle)
- disinfection and decontamination (at least five hours in every CPD cycle) and
- radiography and radiation protection (at least five hours in every CPD cycle).

However, Newton et al. (2000) found that female dentists spend less time in attendance at postgraduate courses than males. This may relate in part to differences in working patterns and practice role between male and female dentists. Social factors and family commitments may also impact here.

Similarly, it has been suggested that those dentists who have been qualified the longest are less likely to read professional journals (Buck and Newton 2002). The authors stated that although this may reflect a greater level of knowledge amongst such practitioners, it could also mean that patients are at risk of not benefiting from recent advances in dental science and evidence-based dentistry.

**Preferred styles of learning opportunities for short courses**

In a study involving 1,357 dentists, Leggate and Russell (2002), found that the majority of respondents indicated an interest in using several different methods of learning. As might be expected, a preference for 'hands on' learning was strongly expressed for clinical procedures. However, lectures were still favoured as one of several useful formats, with small group tutorials, books and journals also popular. Videos were valued by over half of respondents as a useful tool for a variety of different learning scenarios.

**Postgraduate qualifications**

Over the past three years, the Faculty of General Dental Practice (FGDP) (UK) and the Department of Health (DH) have been working together to develop a series of competency frameworks for dentists with special interests (DwSIs). These programmes are considered attractive for dentists because they provide a first stage for dentists, who wish to continue in their training, and possibly go on to become specialists and/or NHS consultants; as their accredited prior learning, training and experience is all recognised for the completion of full specialist training (Drake 2008). For many dentists, it offers the benefits of both the generalist and specialist world (Gallagher et al. 2007).
For dentists, the ability to expand and develop in their careers is thus very important. This is both in terms of long term job satisfaction and in the prevention of burnout. Studies demonstrate that a lack of career perspective can be a crucial factor in the development of burnout (Gorter et al. 1998).

Returning to clinical dentistry after a break

Getting back to practice (GBTP) courses exist in different parts of the country to assist dentists who have been out of clinical practice for an extended period of time, allowing clinicians to regain their confidence and update their skills, in preparation for their return. Each postgraduate dental dean or directors office will have a retaining and returning adviser in post, who are able to advise dentists wishing to return back to clinical practice (NHS Careers 2010). However, commonly, these individuals work on a part-time basis and have other responsibilities within the Deanery.

However, according to Buck and Newton (2002), only a small proportion of dental practitioners attend these retraining courses. A further concern was that those who did return to dentistry following a career break, were unlikely to have undertaken any form of retraining. This may impact upon the quality of care delivered, but it is difficult to ascertain to what extent. These findings mirror the results of the most recent review of the female dental workforce (Seward 2001), which suggested that in 2001, only half (49 per cent) of women had returned to dental practice after a career break. Furthermore, only four per cent had enrolled on the Keeping in Touch Scheme (KITS), a scheme which is no longer available.

Dentist experience and the impact upon performance

Alongside formalised undergraduate and postgraduate study, learning and self-development also occurs as a result of gaining clinical experience. Thus the number of years since graduation could be a significant factor that impacts upon performance. In a study analysing 209 cases brought before the Professional Conduct Committee of the GDC over a five year period between 2003 and 2007, Singh et al. (2009) demonstrated that of these 209 cases, the majority of registrants (61.7 per cent) had graduated between 1978 and 1997 i.e. ten to 30 years ago. 18.7 per cent had qualified between 1968 and 1977, and the group with the least experience graduated between 1998 and 2007, constituted 12.4 per cent. The authors suggest that the group graduating between 1978 and 1997 may have gained in confidence, and lost the initial apprehension of a typical young graduate, but may not yet have gained the knowledge that comes with experience. It is also argued that these clinicians are at their peak of their drive and motivation, and may thus be more likely to push the boundaries of good practice. Thus from this small study, it appears that the number of years of dentists’ clinical experience could have an impact upon performance.

Areas for future research

Due to the mobility of dental professionals across Europe, and the high number of EEA/overseas qualified dentists working in the UK, it would be extremely useful to examine the differences in the respective dental curriculums, to identify how dental practitioners qualifying outside the UK could be supported and inducted to working in the UK.

There are many studies which demonstrate the role and benefits of the vocational training programme in the UK. However, fewer studies have been undertaken on dental foundation training programmes, as it has only recently been implemented in the UK. It would be extremely useful to examine the perceived benefits of these programmes from the point of view of the trainees themselves, as well as their trainers. It would also be useful to examine and compare the varying structures of the programmes that exist, in terms clinical setting and time in each setting.

Numerous studies have discussed the uptake of CPD amongst dentists. Most of these studies have drawn on small and potentially unrepresentative samples – often concentrating on attendance at particular dental schools (Walmsley and Frame 1990). Only one study has examined a representative sample of dental practitioners throughout England and this is now almost 20 years old (Mouatt et al. 1991). Furthermore, most studies have only examined attendance at courses. Alternative forms of CPD such as reading professional journals, distance learning and other activities could be considered, in terms of level of uptake and learning outcomes.
As mentioned previously, over the past three years, the Faculty of General Dental Practice (FGDP) (UK) and the Department of Health (DH) have been working together to develop a series of competency frameworks for dentists with special interests (DwSIs). There is still little research about the outcomes from this new career pathway and further work could be undertaken to examine the uptake, impact and perceived benefits of this new scheme. Further work needs to be taken to examine what training courses could be implemented to support dentists in returning back to work after a career break. This is especially the case for female dentists. Finally, the impact of the number of years of clinical experience upon performance needs to be examined further. In particular, those dentists who graduated between ten and 30 years ago may be an important cohort to focus upon.

Conclusion

- Undergraduate education appears to have a fundamental role in the performance of future dental professionals. In addition to academic achievement, dental schools must therefore promote professionalism, ensuring that undergraduates incorporate the attitudes, values and behaviours to put patients’ interests first, and act to protect them at all times.
- Dentistry is passing through a period of unprecedented change, and particular subjects may form a vital part of undergraduate education. These include leadership and communication skills, as well as understanding the role of and working with the dental team. Education to improve communication in cross-cultural exchanges, in particular, has also been recommended; and small group, skills-based courses were highlighted as being particularly effective in teaching consultation skills to undergraduate dental students.
- It appears that the country of qualification does impact upon dental performance, in that a distinct lack of uniformity of the curricula in dental schools across EEA member states, and other countries, can mean that dentists graduating from these countries may possess varying clinical skills, knowledge, attitudes and may thus demonstrate different working patterns. This will be particularly evident in EEA member states where there is free mobility of the dental workforce. In addition, across Europe, considerable differences in the methods of assessment or quality assurance of undergraduate degrees have been highlighted. However, it is worth noting that overseas dentists who sit the Overseas Registration Exam (ORE) are expected to understand the clinical governance and quality assurance mechanisms in operation in the UK, as part of the clinical and theoretical validation part of this exam.
- Vocational and dental foundation training schemes may play a vital role in the development of the dental graduate, immediately post qualification. Dental foundation training programmes, in particular, provide trainees with a wider range of opportunities to develop their communication, team working and clinical and management skills, when compared to stand alone posts in each service.
- Lifelong learning, continuing professional development and the availability of postgraduate qualifications appear to be very important in enhancing and updating the professional skills of practising dentists.
- For dentists, the ability to expand and develop their careers is considered very important. This is both in terms of long term job satisfaction, and in the prevention of burnout. However, this may not always be the case as it has been highlighted that female dentists spend less time in attendance at postgraduate courses than male dentists. This may be partly due to differences in working patterns. Also, it appears that dentists who have been qualified the longest may be less likely to read professional journals.
- It is suggested that the format in which education is delivered is considered important by dentists and a preference was indicated in one study for ‘hands on’ learning in clinical procedures. Lectures, however, were still favoured as one of several useful formats, with small group tutorials, books, videos and journals also popular.
- The development of career pathways for dentists with special interests (DwSIs) have provided an opportunity for DwSIs, who wish to continue in their training, to become specialists and/or NHS consultants offering, in theory, the benefits of both the generalist and specialist world.
- It is suggested that only a small proportion of dental practitioners attend retraining courses after a career break. A further concern was that those who did return to dentistry following a
career break, were unlikely to have undertaken any form of retraining. This may impact upon the quality of care delivered, but it is difficult to ascertain to what extent. More specifically, a study undertaken in 2001 stated that only half of female dentists had returned to dental practice after a career break. Furthermore, only four per cent had enrolled on the Keeping in Touch Scheme.

- The number of years since graduation, i.e. experience, could be a significant factor that impacts upon performance. In a study analysing cases brought before the Professional Conduct Committee of the GDC, the majority of registrants had graduated between 1978 and 1997 i.e. ten to 30 years ago. The authors argue that whilst this group may have gained in confidence, they may not yet have gained the knowledge that comes with years of experience.

- Areas for further research include investigating:
  - how to support and induct dental practitioners qualifying outside the UK to working in the UK
  - the role and benefits of the dental foundation training programmes
  - the uptake, impact and learning outcomes of CPD amongst dentists
  - the uptake, impact, perceived benefits and learning outcomes of competency frameworks for dentists with special interests
  - the impact of the number of years of clinical experience upon performance needs to be examined further. In particular, those dentists who graduated between ten and 30 years ago may be an important cohort to focus upon.
References


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Section 9: The impact of work-related factors upon performance

Search terms

The search terms used in this domain are listed in Table 13.

Table 13. Search terms used to investigate the impact of work-related factors upon performance

<table>
<thead>
<tr>
<th>Domain</th>
<th>Search Terms Used</th>
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<td>The impact of work-related factors upon performance</td>
<td>Communication skills, Complaints, Patients, Dental workforce, Relationship with the dental team, Competence, Team work, Work environment, Performance of dentists, Dental performance and outcome measures, Dentist performance and outcome measures, Disciplinary measures and dentists, Disciplinary measures and dentistry, Dentists and censure, Complaints in dentistry, Dentist clinical mistakes, Dentist appointment times, Management skills, Dental practice, The role of a dentist, Job satisfaction, Working patterns in dentistry, Dental private practice, NHS dental practice, Private dental practice, Public dental practice, Contractual arrangements in dentistry, Dental care professionals, Patient satisfaction, Leadership, Organisational behaviour in dentistry, Retention of dental workforce, Organisational culture in dentistry, Environment in dental practice, Culture in dentistry, Dental materials and equipment, Staff turnover in dental practice, Facilities in dental practice, Dental body corporate, Recruitment of dentists, Dentist's experience</td>
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Introduction

This section examines how the work environment can fundamentally affect clinicians’ performance, and includes an exploration of the impact of work-related factors on the performance of dentists. This
topic is particularly important in the light of one of the general findings from NCAS Casework: The first eight years (NCAS 2009) that referring bodies often do not fully comprehend the principal environmental (work place) issues that can compromise practitioner performance.

The review commences with a description of the factors likely to affect change in dental practice, to include both environmental and contextual. This is followed by an examination of the impact of organisational change in a national context, and its effect on clinical performance. This concept is particularly pertinent given the forthcoming changes described in the NHS White Paper, Equity and excellence: Liberating the NHS (Department of Health 2010). The 2006 contractual changes in England and Wales will be utilised here as an example, to demonstrate the potential impact of change upon clinical performance. Another important aspect of organisational change is considered, which examines the processes in place to manage poor performance within primary care organisations.

The influence of softer, social contextual factors such as organisational culture and climate are examined, and more specific issues, such as working patterns and gender and clinical setting are considered.

Finally the concept of team work is examined. Team work is a core part of the delivery of dental services and has become increasingly important in the last few years with the development of individual Dental Care Professional’s (DCPs) roles, such as those of clinical dental technicians, dental hygienists, dental therapists, dental nurses, dental technicians and orthodontic therapists. The section concludes with recommendations for further research in this topic area.

**Organisational factors likely to affect change in dental practice**

In dentistry, the quality of clinical performance is strongly related to the ability of the practitioner to respond to change. This may be the ability to deliver different treatments due to changing oral health needs, to undertake new governance procedures in line with emerging regulations, or through continued learning and self-development. An inability to undertake such tasks and respond to change may result in poor performance. Therefore, it is important to understand the factors likely to affect change in dental practice. In a study involving 366 general dental practitioners, Watt et al. (2004a) found that personal factors, including age of the dentist and attitude to the adoption of specific techniques can all influence change. Involvement in continuing education, contact with dental colleagues, the practice environment and other organisational factors such as degree of delegation to team members were also considered to be important.

The practice characteristic that made the most significant difference in levels of self-reported change was the proportion of private treatment undertaken in the clinic. Those with greater than 20 per cent private practice were significantly more likely to report higher levels of change in practice management, clinical practices, communication with patients, quality assurance and educational and staff development (Watt et al. 2004a).

**The impact of national organisational change: Recent changes to NHS dentistry**

Healthcare in the UK is predominantly state-financed and is delivered through the National Health Service (NHS). However, in the last two decades, dentistry has been dominated by the politics of the NHS, by changing contractual arrangements and fee structures, initiated by successive governments. Examples include the contractual reforms of 2006, and most recently, the structural changes described in the NHS White Paper, Equity and excellence: Liberating the NHS (Department of Health 2010). Such fundamental changes can generate uncertainty and additional stress for practitioners, which could certainly impact negatively upon performance, especially during transitional stages.

The following section outlines the implications of the 2006 changes in England and Wales and the impact upon clinical performance.

Since 2002, 80 per cent of the NHS budget has been held by primary care organisations, local organisations responsible for local needs assessment and commissioning healthcare according to the needs of the local population (Harris et al. 2008). In April 2006, fundamental contractual changes occurred in NHS dentistry in England and Wales. This involved the dissolution of a universal national contract and the introduction of locally commissioned primary dental care services (Chestnutt et al.
2009). The responsibility for decision making and resource allocation within dentistry was devolved to PCTs and local health boards (LHBs), respectively (Department of Health 2007). According to the Department of Health (2005), the stated objectives of the new contract were to:

- commission dental services locally
- improve access to service for NHS patients
- remove the item of service ‘treadmill’ which many dentists perceived they were working
- encourage fewer interventions, freeing up time for a more preventive approach
- introduce a simplified system of patient charges
- make NHS dentistry more attractive to dentists and improve the quality of dentists’ working lives.

One of the key objectives of the new contract was to make NHS dentistry more attractive to dentists and improve the quality of dentists’ working lives. However, this has not necessarily been the case.

**How have the new contractual arrangements impacted upon the performance of dentists?**

Change is always challenging, and the anger from the profession was summarised by Steele (2009) under the following headings:

- For some dentists, a sense of professional frustration about how they feel they are having to practise, and a perception that it adversely affects their patients (lack of financial incentives to undertake preventative work)
- For most dentists, the perceived uncertainty it creates, particularly in terms of business risk
- For many dentists, poor or inappropriate commissioning is frustrating
- A general suspicion of government motives and the lack of piloting
- Growing bureaucracy.

There is anecdotal evidence to suggest a likely association between the 2006 contractual changes and poor clinical performance. There is also evidence to demonstrate a change in the patterns of care provided under NHS contract since 2006, which some considered to be detrimental to patients’ oral health (Health Select Committee, 2008). It therefore seems that the above issues impacted on job satisfaction and the quality of clinical work undertaken and potentially directly contributed to poor performance. In addition, the challenges and additional workload could contribute to stress, anxiety and burnout. As demonstrated in Section 5, such negative feelings can compromise performance (Gorter et al. 2000, Myers and Myers 2004, Kay and Lowe 2008, Te Brake et al. 2008). These aspects of performance are discussed in greater detail below.

**Job satisfaction and commitment to the NHS**

As a result of these contractual reforms, it has been argued that many disillusioned dental practitioners reduced their commitment to, or fully opted out of the NHS, thus committing themselves, to a greater extent, to private practice (Holt 2008, Harris et al. 2009). Furthermore, it has been found that after the contractual reforms, the proportion of dentistry provided privately, as measured by gross fees, exceeded that provided within the NHS (Holt 2008).

Similarly, Chestnutt et al. (2009), in a study involving a third of all dentists in Wales, found that the majority of dentists continued to provide NHS dental services following the introduction of the new contract. However, about one quarter claim to have decreased their commitment to the NHS. The authors concluded that 18 months after the contractual reforms, practitioners were deeply unhappy with the new commissioning arrangements. Only 46 (11 per cent) of the 417 practitioners agreed that they liked the new method of remuneration. The main issues focussed on working within a ‘treadmill’ environment, not being incentivised to undertake preventative dentistry, and finally, a feeling that local NHS commissioners were controlling their business. These may all contribute to feelings of stress, anxiety, or burnout which can all compromise performance (Gorter et al. 2000, Myers and Myers 2004, Kay and Lowe 2008, Te Brake et al. 2008).
Harris et al. (2009), in a study of 684 dental practitioners, found that job satisfaction had reduced following the contractual reforms. Similarly Denton et al. (2008) argued that both the contractual reforms, and the fee-per-item treadmill which existed prior to the introduction of the new contract, were the origin of the severe work pressures experienced by UK general dental practitioners.

Clinical quality
The Health Select Committee (2008) report highlighted the following concerns about the quality of clinical work being undertaken by general dental practitioners:

- The number of complex treatments involving laboratory work fell by 50 per cent during the first year of the contract
- The number of root canal treatments fell by 45 per cent since 2004
- At the same time the number of tooth extractions increased.

Steele (2009) highlighted that some practitioners were often adopting behaviour that would serve to maximise the rate at which the units of dental activity (UDAs) are achieved, often referred to as “gaming”, to release time for other activities. It is argued, that “gaming” has existed in every contract, from the very beginning of the NHS. However, it was highlighted that the UDA based system is associated with some specific “gaming” behaviours related to the UDA bands.

Another finding focussed on providers sanctioning approaches to care, treatments or techniques that had the sole purpose of increasing the number of UDAs. Examples include recalling patients more frequently than clinically necessary Steele (2009).

Commissioning and activity targets
PCT commissioning of dental services has been described as poor (Health Select Committee, 2008). Many PCTs were said to possess weak in-house commissioning skills and were failing to make full use of specialists and consultants in dental public health in the assessment of local dental needs. Furthermore, PCTs were seen as setting unrealistic activity targets and applying UDAs too rigidly, which could significantly impact upon the performance of a dentist. The concept of “clawback” seemed to be a particular problem for practitioners.

Professional governance
The performance of individual practitioners is increasingly being challenged as new regulatory mechanisms for the delivery of care develop (Batchelor and Brooks 2009). This growing bureaucracy in the provision of NHS dental services has been viewed as a particular source of frustration. Wider changes in regulation and governance impact the practitioner significantly, mostly from the point of view of lost opportunity costs, due to the significant time required to undertake such responsibilities (Steele 2009).

Contributory factors for stress, anxiety and depression
It is reasonable to assume that the pressure of meeting agreed UDA targets, or the threat of “clawback” if the target is not achieved, may generate additional stress and anxiety in dentists. Frustration due to poor commissioning skills may also contribute to this.

Similarly, the increasing administrative burden of emerging governance and regulatory mechanisms may well add to the stress of running a practice, and managing staff and patients.

It is thus clear that although there is no evidence to suggest a likely association between the 2006 contractual changes and poor clinical performance, the changes have indirectly impacted upon the performance of general dental practitioners in England and Wales through the additional stress, frustration and anxiety they can generate. They have also led to changes in the type of treatment that many patients receive (Health Select Committee 2008).
The impact of organisational change: Examining processes to manage poor performance

NCAS’ findings from dental casework (NCAS 2009) reveal that significant differences exist in the referral patterns of individual primary care organisations throughout the UK. This may impact upon the management, and effective remediation of poor performers. Long term, this may negatively impact upon performance. A number of reasons for this were identified. NCAS found that those with responsibility for working with dentists tend to be more junior within their organisation, less likely to be able to take autonomous decisions and more likely to show increased mobility in the work force. The quality of this internal management process is thus an important factor in the management and effective remediation of poor performance.

Examining the impact of organisational culture on performance

Organisational culture has been defined to include a wide range of social phenomena, including an organisation’s customary dress, language, behaviour, beliefs, values, assumptions, symbols of status and authority, ceremonies and rituals, and modes of deference and subversion; all of which help to define an organisation’s character and norms (Shein 1990). These social factors will profoundly influence the behaviour of those individuals who work within the organisation, or come into contact with it. It can be assumed that the behaviour of healthcare professionals, and their performance, is thus greatly influenced by the culture of the organisation within which they work.

There is no literature which examines the impact of organisational culture upon practitioners working in general dental practice. However, some studies have been carried out which involve doctors. Certain parallels can be drawn from these studies. West and Spendlove (2006) described how by definition, culture will affect the performance of doctors. In the same way that human behaviour is influenced by the social environment, the performance of a doctor, will be influenced by the norms and values embodied in the prevailing organisational culture. The same conclusions could probably be drawn about dentists.

More specifically for dentistry, it has been suggested that Personal Dental Service (PDS) arrangements provided a means of changing the culture of primary dental care provision to one based on quality, rather than activity and cost, although outcome evaluations have been limited due to methodological problems associated with a lack of suitable comparator practices (Goodwin et al. 2003).

For more than ten years, quality and performance improvements have been articulated as central policy objectives for the NHS. Furthermore, securing meaningful change in organisational culture, together with concomitant structural reforms, is seen to be critically important in achieving these objectives (Sutherland 2004). According to the Department of Health (A First Class Service: Quality in the new NHS 1998), meaningful and sustainable quality improvements in the NHS require a fundamental shift in culture, to focus effort where it is needed and to enable and empower those who work in the NHS to improve quality locally.

The impact of local work based factors upon performance

The conditions that clinicians are exposed to at work, can have a significant impact on their performance. The impact of work based factors such as professional networking, working patterns, clinical setting and team work are now discussed.

Professional networking

Watt et al. (2004b) demonstrated how unlike many other parts of the NHS, GDPs can often be very isolated from their colleagues. Professional networks, both formal and informal were seen to have a major influence over the performance of dentists. GDPs who did not belong to any network, and were professionally isolated, lacked support mechanisms and this could compromise performance. These findings are supported by the results of a study in the north west of England which showed that the majority of GDPs turned to friends and colleagues for help and support when faced with clinical uncertainties (Iqbal and Glenny 2002).
Working patterns

When examining working patterns and impact upon the performance of dentists, the literature mainly focuses on differences related to gender. As explained in greater detail in Section 3, female dentists are more likely than male dentists to work part-time due to family commitments, and this may have implications for the dentist in terms of productivity and workload (Wilson et al. 1988). However, such a work-life balance could also have a positive effect in terms of job satisfaction and low stress levels. This could impact upon performance in a positive way.

Clinical setting

In the period immediately before April 2006, GDPs could work as an NHS General Dental Service (GDS) practitioner (fee-per-item, no local contractual obligations), or an NHS Personal Dental Service (PDS) practitioner (block contract with the PCT, or a private practitioner (either fee-per-item or capitation-based, independent of the PCT), or in a situation where they were mixing their NHS work (either under the GDS or PDS arrangements) with private work (Harris et al. 2008). In addition, practices were either single-chair or multi-surgery.

However, Harris et al. (2008), revealed in a study of 446 dentists, that fully NHS GDS practitioners were most likely to feel restricted in providing quality care, followed by practitioners either working in fully NHS PDS practices, or part PDS/private practices. GDPs working in a mixed GDS/private practice were least likely to feel restricted in providing quality care. Furthermore, both GDS and PDS practitioners working in mixed NHS/private practices showed a more positive attitude towards developing further clinical skills than practitioners working in wholly NHS practices, either in the GDS or the PDS.

In a similar study, involving 684 dentists from different regions within England, Harris et al. (2009) showed that 46 per cent of dentists working in wholly NHS practices, under GDS arrangements, were satisfied or very satisfied with their jobs, compared to 60 per cent of dentists working in wholly NHS practices under PDS arrangements. A similar proportion of PDS practitioners working in mixed NHS/private practices felt satisfied or very satisfied (56 per cent), although significantly more practitioners (70 per cent) who work in mixed GDS/private, felt this way about their job. Even though numbers of completely private dental practitioners, in the sample, were low, as many as 83 per cent felt satisfied or very satisfied.

The impact of the dental team upon clinical performance

Defining the dental team

The dental team has been described in the GDC document, Principles of Dental Team Working (2009), as the group of people who together, provide care for a patient. Team work in dental services means working together to provide good quality dental care (GDC, 2009).

It also emphasises the importance of the dental team in ensuring that optimal care is delivered to the patient. It describes how it is vital that all members of the dental team contribute to the patient’s experience of dental treatment, and how each individual has a role to play in making the best possible contribution to patient care.

Since April 2006, individual members of the dental team have been recognised collectively as Dental Care Professional (DCPs). These are listed by the GDC (2009) as the following:

- Dentists
- Clinical dental technicians
- Dental hygienists/Dental therapists
- Dental nurses
- Dental technicians
- Orthodontic therapists

The concept of dental care delivered by a multi-skilled team is now well established. For example, since 2002, dental therapists, whose practice was previously restricted to the hospital and community
dental services, have been free to work in general dental practice (British Association of Dental Therapists 2010)

**The impact of team work on patients**

Bonehill et al. (2007) described how working in a first-rate team can lead to a stress free environment and is crucial for successful delivery of quality patient-centred care (Figure 10).

**Figure 10. The Patient-Centre Team (Bonehill et al. 2007)**

- **Exchanging the extent to which effective team work can impact upon the performance of a dentist**

The concept of team working in dentistry has gained significant momentum in the last few years, resulting in growing recognition of the contribution of all members of the team to the care and treatment of patients (Ross et al. 2009). It has been suggested that expanding the roles and training capacity for DCPs is vital to develop the dental team (Harris and Haycox 2001). It has long been recognised that the deployment of a full range of skill-mixes in dental teams can provide acceptable and high quality dental services more cost-effectively than services provided by dentists alone (Baltutis and Morgan 1998). A shift towards the development of larger practices, with a wider skill-mix thus seems advantageous (Croucher et al. 1998).

The successful utilisation of DCPs in current and future dental services is thus dependent on skill-mixing and team building to allow a multidisciplinary approach in delivering dental care. However, the acceptance by dentists of the developing role of DCPs is crucial in allowing this shift towards team work (Ross et al. 2009); and there is recent research which demonstrates that such acceptance is not yet established. A Norwegian survey of 504 dentists and 112 dental hygienists, found that dentists preferred not to share clinical work, even when it was within the remit of the dental hygienist (Abelsen and Olsen 2008). In the UK, surveys of general dental practitioners have reported poor knowledge regarding the capabilities of hygienist/therapists, a reluctance to consider their employment, and negative attitudes towards them in general (Jones et al. 2007).

Ross et al. (2007), in a study of 310 dentists from south east Scotland, showed that knowledge and acceptability of hygienist/therapist employment were greater amongst dentists working in larger
practices, or those employing additional personnel such as associates, vocational trainees or hygienists. The authors concluded that the hygienist/therapist may be well received by patients and dental workforce planners but, given their current need to work to a dentist's prescription, their acceptance by dentists is critical. Education of dentists was recommended to raise their awareness of the roles, responsibilities and remit of hygienist and therapists.

Finally, aspects of micro-workforce planning need to be considered, from the point of view of an employing GDP. According to Sprod and Boyles (2002), the GDP bears full responsibility, and consequently the risk, when planning to expand a practice and/or employ DCPs. There are a variety of factors which need to be considered here: the size and nature of the local population, the population's demands and needs for dental care, the skill-mix required to meet these needs and demands, the ability to recruit and retain staff, the size of their premises, the resources available and financial risks. The authors emphasise the importance of developing methods to support GDPs in workforce planning through improving their ability to undertake such assessments.

**Recruitment and retention of the dental workforce**

Studies suggest that there is a relatively high turnover of all dental staff, including dentists (Newton and Gibbons 2002). Sprod and Boyles (2002), in a study involving 501 dental practices in the south west of England, demonstrated that on average, practices can expect to recruit a new dental nurse every two years, a new hygienist every four years, and a new dentist every five years. Retention problems were coupled with perceived difficulties in recruitment of all members of the dental team, particularly in rural areas. The authors reported that problems with recruitment and retention of staff are due to several factors relating to small pools of local job-seekers, for example in areas with low unemployment and high competition for similarly skilled staff, low wages, poor career perceptions or long term prospects, and a shortage of local training opportunities. The researchers also found that the high turnover rate in the dental workforce was principally due to job dissatisfaction, as well as other factors to include levels of income, financial and professional commitment, career breaks, general mobility of the population and other socio-demographic factors. It is worth noting, however, that this study was regional, and its findings, whilst not representative of the whole country, may be fairly applicable in other similar rural areas in the UK.

**Areas for future research**

A variety of factors have been identified which can compromise a practitioner's performance and the reviews of the contractual changes of 2006 specifically outlined fundamental issues to consider. Other than factors directly associated with the nature of the contract itself, it would be extremely useful to undertake further research to assess the levels of job satisfaction in varying clinical settings, particularly in light of its association with stress, a factor which can compromise performance in some individuals. In addition, an examination of the factors which affect levels of job satisfaction in varying clinical settings should be explored further. Dental body corporate organisations, given their recent growth in the dental market, many need specific consideration here. Anecdotally, as commercial companies, it is accepted that these organisations are driven by financial targets and as a result, may have high levels of staff turnover. It would thus be useful to include such a clinical setting into further research examining job satisfaction. More general differences in levels of job satisfaction of practitioners working in single-chair and multi-surgery practices should also be considered. Additionally, comparisons could be made between practitioners working within the NHS and those delivering private care. This factor is especially pertinent given the continued growth of the private dental sector.

The attitude towards the development of clinical skills also appears to vary according to clinical setting, and given the association with the development of burnout, further investigations could examine the drivers behind such different attitudes to self-development.

As explained by West and Spendlove (2006), the links between the culture of an organisation and the performance of individuals appears to be obvious. However, an examination of the literature reveals that no meaningful studies exist which directly link organisational culture with the performance of dentists, or with any other healthcare professional group. Lack of methodological vigour and sophistication of design, absence of standardised objective measures for culture and performance, and the small number of studies conducted in hospital settings mean that direct associations remain
obscure. It is recommended that future research should focus on key outcome variables and the identification of the elements and dimensions of culture that are likely to be related. These associations could then be studied in depth.

Regarding team work, and the deployment of the full range of skill-mixes within a dental team, it is crucial to understand the current levels of utilisation of DCPs within the dental team in general dental practice. In addition, Gallagher et al. (2010) stated that in order for team work to work effectively, changes may be required at practice level, with facilities that support team working. The authors recommended that policy makers need to explore the challenges and benefits of implementing the optimal skill-mix workforce, against the feasibility, practicality and desirability of doing so within a local practice setting. Specifically, barriers to the use of such professionals could be examined, to include contractual issues, as well as attitudes and perceptions of employing dentists, and logistical implications in terms of facilities, equipment and space.

Differences in retention between members of the DCP team should also be explored. In general dental practice, dental therapists, hygienists and technicians are commonly self-employed whereas dental nurses are more often employed by a principal. This difference in employment status may mean that those individuals who are self-employed (as opposed to an employee), may feel more in control of their work environment and career. This could impact upon staff turnover, and it would be useful to explore the possible differences in retention between these members of the DCP team.

Finally, the micro-workforce planning that must be undertaken by an employing GDP, in the recruitment of the dental team must be considered. Further research needs to be undertaken to ascertain how best to support such dentists in planning a team that is able to serve the needs of the local population most effectively, whilst simultaneously ensuring that services are delivered in the most cost effective and productive manner.

Conclusion

- In dentistry, the quality of clinical performance is strongly related to the ability to respond to change. This may be the ability to deliver different treatments due to changing oral health needs, to undertaking new governance procedures in line with emerging regulations, or to continued learning and self-development. An inability to undertake such tasks and respond to change may result in poor performance.
- Factors likely to generate change in dental practice include personal factors, such as the age of the dentist and attitude to the adoption of specific techniques, involvement in continuing education, contact with dental colleagues, the practice environment and other organisational factors such as degree of delegation to team members.
- In April 2006, new contractual arrangements were implemented in the NHS in England and Wales. One of the key objectives of the new contract was to make NHS dentistry more attractive to dentists, and improve the quality of dentists’ working lives. However, as demonstrated in this review, this has not necessarily been the case. Studies have revealed that levels of job satisfaction amongst GDPs have reduced since the introduction of the new contract. The main concerns appeared to focus on a lack of financial incentive to undertake preventative dentistry and the feeling of working on a “treadmill”. PCTs were perceived to be placing pressure on GDPs to perform, by setting unrealistic activity targets and applying UDAs too rigidly, with the concept of “clawback” being a particular problem. Such concerns are set against a wider backdrop of changes in regulation and governance in the NHS. The growing bureaucracy in the provision of NHS dental services has been viewed as a particular problem.
- There is no evidence to suggest a likely association between the 2006 contractual changes and poor clinical performance. However, it is clear that the above issues could inevitably impact upon job satisfaction and the quality of clinical work undertaken, both potentially directly contributing to poor performance. In addition, these challenges and additional workload contribute to stress, anxiety and burnout.
- Organisational culture constitutes a range of social contextual factors which can profoundly influence the performance of those who work within the organisation. There is no direct evidence to demonstrate a relationship between culture, and the performance of a doctor or
dentist. However, given what is understood about the associations between culture and behaviour, it seems reasonable to assume that there is a link.

- Professional networks, both formal and informal were seen to have a major influence over the performance of dentists. Dental practitioners who did not belong to any network, and were professionally isolated lacked support mechanisms which could compromise performance.

- Female dentists are more likely than male dentists to work part-time due to family commitments. This may have implications for the dentist in terms of productivity and workload. However, conversely, this could also mean a better work-life balance which could enhance clinical performance.

- The impact of clinical setting on the performance of a practitioner was identified as significant. Studies revealed that NHS practitioners may feel restricted in their ability to deliver quality care, in different clinical settings. Wholly NHS practitioners in the GDS were most likely to feel restricted in providing quality care, and that dental practitioners working in a mixed GDS/private practice were least likely to feel restricted in providing quality care. Furthermore, both GDS and PDS practitioners working in mixed NHS/private practices were more positive about the development of their clinical skills than practitioners working in wholly NHS practices.

- Career development is an important factor in the prevention of burnout, and is thus an important consideration. Job satisfaction, another variable in stress and burnout, was also shown to vary according to clinical setting.

- The importance of team working in dentistry is fully acknowledged in the literature. Studies report that the deployment of the full range of skill-mixes within a dental team offers advantages of increased productivity and efficiency, and a reduced number of visits per patient, per course of treatment, and a more cost-effective service. Such advantages will indirectly impact upon the performance of a dentist, principally due to a reduced workload, and the benefits of reduced stress and burnout from a more efficient work environment.

- The acceptance by dentists of the developing role of DCPs is crucial in allowing this shift towards greater team work, to generate the associated benefits.

- Recommendations for further research include investigating:
  - the levels of job satisfaction in varying clinical settings, particularly in light of its association with stress, a factor which can compromise performance in some individuals
  - the factors which affect levels of job satisfaction in varying clinical settings
  - job satisfaction, treatment outcomes and patient satisfaction in practices run by dental bodies corporate, given their recent growth in the dental market and commercial ethos, many need specific consideration
  - the drivers behind the different attitudes to self-development in different clinical settings
  - the association between organisational culture and the performance of dentists
  - team work and the deployment of the full range of skill-mixes within the dental team
  - possible differences in retention between those members of the DCP team who are self-employed and employed.
References


Department of Health. Equity and excellence: Liberating the NHS Gateway 14385. London 2010


National Clinical Assessment Service. NCAS Casework: The first eight years. September 2009


Section 10: Leadership in NHS dentistry

Search terms
The search terms used in this domain are listed in Table 14.

Table 14. Search terms used to investigate the impact of leadership in NHS dentistry upon performance.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Search Terms Used</th>
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| Leadership in NHS dentistry   | Leadership
                                          | Team work
                                          | The role of a dentist |

Introduction

It is generally accepted that good leadership is essential in any type of organisation. In this section, the leadership responsibilities of dental public health consultants, healthcare organisations such as PCTs and SHAs and individual dentists will be defined. The leadership role of the specialty of dental public health in the UK will also be explored, and recommendations made as to how it may be improved. Consideration is also given to leadership at a more individual level, in terms of how a dentist interacts within the dental team.

Leadership is especially important during times of change or disruption. An example of such a change resulted from the 2006 contractual changes which affected NHS dentistry in England and Wales. Further changes are predicted in view of the structural reform outlined in the NHS White Paper, Equity and excellence: Liberating the NHS (Department of Health 2010). Such fundamental changes require strong leadership, especially during these transitional stages.

Section 9 examined the impact of such organisational change upon performance. This section will examine how a lack of leadership in NHS dentistry may have contributed to the problems experienced during this transition period. No literature exists to demonstrate a direct association between a lack of leadership and poor clinical performance. However, this section discusses how a lack of leadership may have been a strong contributing factor to some of the problems experienced by dentists in England and Wales over the last four years (Steele 2009).

Understanding leadership in NHS dentistry- who are the leaders?

Effective leadership is vital within the NHS, and NHS dentistry is no exception to this. In the last few years, SHAs have had a responsibility to lead, develop and manage the performance of the NHS in their region. PCTs and LHBs have a statutory responsibility to provide, or secure the provision of oral health needs assessments and oral health improvement programmes, as well as specialist and primary dental services, to meet all reasonable requirements within their area. It is also thought that dentists, as front line practitioners, have a role to play in driving change and influencing policy. This could be undertaken through a variety of key roles such as a Dental Practice Adviser, Vocational Dental Practitioner Trainer/Adviser, Dental Reference Officer, or dentist with a national profile. However, it is argued that dentists have failed to be proactive in shaping the systems for the delivery of an optimal level of care to the population (Holt 2008). This author suggested that there is a need for far better leadership within NHS dentistry, and for dentists, as individuals and as a profession, to play a greater role in shaping their own vision, rather than just accepting the current situation.

Dental public health consultants and specialists as leaders in NHS dentistry: Current capacity in the UK

In the NHS, clinical leadership should come from consultants and specialists in dental public health (DPH), who generally have responsibility for ensuring that PCTs and LHBs have plans in place to meet the oral health needs of a local population. Thus immediate access to advice from a consultant or specialist in DPH is essential in every PCT/LHB.
Steele (2009) identified examples of excellent commissioning of dental services at a local PCT level, where a clear infrastructure in the PCT was evident, supported by demonstrable leadership – both clinical and executive. However, the study found that generally, dental commissioning was being undertaken by relatively junior members of the commissioning team who had to juggle multiple responsibilities with little senior management support, and sometimes without the appropriate dental public health advice and support.

Furthermore, the DPH workforce in England is very thinly spread, with around one-third of PCTs without any current access to consultant/specialist advice (Department of Health 2010). In 2007, around two-thirds (104) of the 152 PCTs in England had some level of input from a consultant in DPH, as did nine of the ten SHAs. Even in those PCTs with some measure of consultant input, the level of input in most places is low with an average whole-time equivalent consultant input to PCTs of less than two days a week.

Examining the role of the dentist as the leader of the dental team

When considering the impact of dental leadership at a national, regional and local level, it is important to consider dental practitioners (both commissioned and employed) as front line staff, and their role in leading the dental team.

As discussed in Section 9, in dentistry, working in a team means that individuals are valued, feel able to contribute to the organisation and smooth running of the dental surgery, and have their views heard and respected. The team leader, the dentist, will thus need to ensure that the strategic objectives of the practice are understood and that everyone is involved and committed to these plans (Bonehill et al. 2007). Gallagher and Wilson (2009) explained that given the developments in oral health sciences and the anticipated changes to the clinical practice of dentistry, dentists of the future will need to take the lead on planning a dental team capable of providing holistic, multifaceted, patient-centred care, which complements general healthcare provision.

The concept of the dentist leading a flexible workforce offering an interchangeable mix of skills has existed for many years (Csikar et al. 2009). As team leader, the dentist is responsible for providing a written prescription, together with the diagnosis, treatment planning and quality control of treatment provided (GDC 2004).

Furthermore according to Bonehill et al. (2007), a good leader in a dental practice will:

- have a strong customer focus – a patient-centred approach
- be obsessive about providing quality dentistry
- understand the role and value of each team member
- develop and motivate the team through continuing education and training
- look for faults and take responsibility for the professional conduct of the team ensuring that the patient is protected at all times
- involve all team members in regular meetings to consult
- agree and update everyone on new systems and procedures ensuring their co-operation.

A dentist’s leadership style directly affects an office’s communication practices, and specific leadership behaviours affect the degree of team identity, interdependence and social distance. Furthermore, both leadership and communication behaviours have been identified as highly significant in creating a real “team culture”, which, can inevitably lead to increased overall productivity, an enhanced level of services provided to patients and improved team member satisfaction (Chilcutt 2009).

Interestingly, gender and age are viewed to impact upon qualities of leadership, and the relationships that develop between the dentist, as a leader of the dental team, and the dental nurse. Male dentists, compared with female colleagues, can show a more “businesslike” leadership style and gender interacting style, whereas female dentists show higher mean scores on “friendly” leadership style and professional interacting style (Gorter et al. 2005). The authors also suggest that a younger dentist, with less experience of clinical dentistry, may lack experience in staff management, which may increase the propensity for problems to arise when interacting with assistants.
There is evidence in the literature to suggest that training and education in dental leadership and communication are vital. A lack of such skills can place dentists at a disadvantage, leading to high degrees of staff-related stress and turnover within the dental team (Chilcutt 2009). More general clinical leadership programmes include those delivered by the Kings Fund (Kings Fund, 2010). The transformation of leadership capacity and capability through the NHS is also being supported by organisations such as the National Leadership Council (National Leadership Council, 2010). Within dentistry, existing formal leadership development programmes, such as the diploma in dental care leadership and management, at the Faculty of General Dental Practice (UK), are directed primarily at mid-career dental professionals who are in or are moving towards leadership roles. Less emphasis has been placed on leadership development within the undergraduate dental curriculum, yet this may represent an important opportunity to inspire, encourage, and enhance the development of the dental leaders of the future (Victoroff et al. 2009).

Victoroff et al. (2008) found that dental students were interested in developing leadership skills and it was considered important for them to be taught these skills and acknowledge that leadership skills could be learned. Dental schools should thus consider including skills such as staff appraisal, conflict management and other leadership skills in the curricula (Gorter et al. 2006). Furthermore, given the steadily growing percentage of females entering the dental profession, it is also essential to raise both dentists’ and nurses’ awareness of gender influences in professional communication by including these topics in leadership education (Gorter et al. 2005, & 2006). This would be particularly applicable in the training of all DCPs.

**Understanding the impact of a lack of leadership in NHS dentistry**

Since the inception of the NHS, dentistry has been dominated by the politics of the NHS, by changing fee structures and contracts and by strategies adopted by successive governments, especially during the last two decades. The most recent example is the contractual reforms of 2006.

It is important to note here that amongst the genuine concerns about the structure of the 2006 contract itself, dentists noted “poor or inappropriate commissioning” as a problem. Dentists generally viewed the new contract with suspicion and their subsequent experience was heavily influenced by the way their local PCT approached their new responsibility. In addition, it was the first time that dentists had begun to interact closely with health organisations outside their individual practices. They became exposed to scrutiny that they had never experienced before, as part of a process of commissioning that fully integrated dentistry into the NHS. Many dentists found this threatening and challenging.

The Health Select Committee Report on Dental Services (2008) outlined similar findings. PCT commissioning of dental services was described as poor. Many PCTs were seen to possess weak in-house commissioning skills and failed to make full use of specialists and consultants in DPH when assessing local dental needs and commissioning services. SHAs, which have leadership responsibility in the performance management of PCTs, were failing to do this adequately.

Furthermore, after the implementation of the 2006 contract, the total numbers of dentists working for the NHS and the activity (number of courses of treatment) they had provided for the NHS fell, albeit slightly. In addition, the total number of patients seen by an NHS dentist between December 2005 and December 2007 also fell by 900,000 compared with the two years up to March 2006 (Health Select Committee Report on Dental Services 2008).

Although the majority of these complaints and issues are a direct result of the structure and nature of the contract itself, and the way in which it was implemented, it is entirely possible that these negative changes could have been prevented or mitigated with improved guidance and leadership at PCT and SHA level and enhanced leadership skills from dental practitioners (there are two sides to this relationship).
Recommendations: Developing leadership within the NHS at a local, regional and national level

A key recommendation from Steele (2009) was that PCTs are held responsible, as part of the world class commissioning assurance process, for their effectiveness in commissioning dental services, particularly with regard to the PCT’s leadership, public engagement and clinical engagement - specifically using consultants or specialists in dental public health. A review of the capacity and capability of the dental public health workforce has also recommended this, (Improving oral health and dental outcomes: Developing the DPH workforce in England 2010). Improved leadership from dental public health consultants may thus improve the quality of PCT dental commissioning, and therefore indirectly improve practitioner performance through aspects such as reduced stress in negotiating contracts and improved job satisfaction.

The report described the key roles and responsibilities of a DPH consultant in providing expert advice and professional leadership in the processes of:

- local oral health needs assessment
- development and implementation of local oral health strategies
- dental commissioning
- oral health improvement programmes
- the development of clinical pathways
- patient safety
- innovation and quality improvement
- productivity improvement
- clinical and public involvement
- addressing oral health inequalities
- improving governance systems for dentistry and oral health
- evaluating oral health services
- teaching and training
- research.

An increase in the capacity and capability of the DPH workforce is required to achieve this vision for dental public health. These capabilities can be framed in terms of the world class commissioning competencies, which describe the commissioning capabilities required of PCTs to be world class commissioners in dentistry. The Department of Health (2010) has defined the key roles of the consultant and DPH team in enabling the PCT to achieve world class commissioning competencies in dentistry. Two of these are relevant to leadership (Table 15).

Table 15. Key leadership roles of the consultant and dental public health team in enabling World Class Commissioning Competencies in Dentistry

<table>
<thead>
<tr>
<th>World class commissioning competencies</th>
<th>Consultant in dental public health and team members</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Recognised as the local leader of the NHS.</td>
<td>Set the strategic direction in dentistry/oral health improvement and influence policy, priorities and performance in the wider health agenda.</td>
</tr>
<tr>
<td>2. Lead continuous and meaningful engagement with clinicians to inform strategy, and drive quality, service design and resource utilisation.</td>
<td>Work in partnership with dental practitioners and their teams and secondary care clinicians to improve the delivery of safe, high quality services which meet the needs of patients, promote oral and general health and reduce dental/oral disease. (With the DPA, Oral Health Improvement Programme (OHIP) and Dental Reference Officer (DRO) of the Dental Reference Service).</td>
</tr>
</tbody>
</table>
Areas for future research

There is significant research which investigates leadership at a more individual level, in terms of how a dentist interacts within the dental team. However, the dentist’s wider leadership role, beyond clinical practice, has not been fully explored. Future research could investigate how dentists, as individuals and as a profession, could play a greater role in informing policy nationally.

Leadership development programmes for dental students are essential and can have obvious benefits for the dental workforce. However, for those interested in creating leadership development programmes for dental students, there is a lack of research findings regarding students’ perceptions of the importance of leadership abilities and/or their interest in developing leadership skills during dental school, yet this information could inform the design of leadership development programmes (Victoroff et al. 2009). Additional research could investigate the long term impact of leadership development programmes offered during students’ education.

The NHS White Paper, Equity and excellence: Liberating the NHS (Department of Health 2010) describes fundamental policy changes for the NHS in general, and it will impact upon all practitioners within the NHS. Future research should focus on the impact of such structural changes, in terms of impact upon performance.

Conclusion

- Strong clinical leadership in NHS dentistry is paramount. It needs to be promoted actively, and included in other NHS leadership initiatives, as well as in local engagement at PCT level.
- Until 2012, SHAs have the responsibility to lead, develop and manage the performance of the NHS in their region.
- Currently, PCTs have the statutory responsibility to provide, or secure the provision of oral health needs assessments and oral health improvement programmes, as well as specialist and primary dental services, to meet all reasonable requirements within their area.
- Developing the consultant as a leader of the DPH team within wider talent management and leadership development plans will both ensure that SHAs and PCTs maximise the potential of the dental public health team, and enhance professional leadership and clinical engagement within dentistry.
- The individual dental practitioner can play a role in driving change and influencing policy, but this is not widely undertaken.
- At a more local level, leadership within the dental team is vital. The productivity, level of satisfaction and clinical performance of the dental team is strongly influenced by the dentist.
- Leadership and communication behaviours have been identified as highly significant in creating a real “team culture”. Gender and age were also identified as playing an important role in leadership, and the relationships developed between the dentist and dental nurse.
- Male and female dentists differ in their leadership style and younger dentists, with less experience of clinical dentistry, may lack experience in staff management.
- The development and inclusion of dental leadership education programmes is an important measure to develop effective leadership skills.
- NHS dentistry has undergone significant structural and contractual change in the last few years and is about to undergo a further change. On one hand, change always brings with it a range of problems associated with disruption, resistance to change or just genuine “teething problems”. However, change can also bring opportunities that leaders can exploit. Effective leaders seek these opportunities and look to minimise the difficulties. The contractual reforms in 2006 brought a wide range of complaints from GDPs, and poor commissioning by PCTs seemed to be an issue. Furthermore, key Health Select Committee and Department of Health documents produced subsequent to the 2006 contractual changes, in particular, highlighted a lack of dental leadership at SHA and PCT level as a strong causative factor of some of the challenges experienced.
- Increasing the capacity and capability of the dental public health workforce to improve access to dentistry and enhance the quality, safety and effectiveness of services was thus identified as a key recommendation in moving forward.
- Recommendations for future research involve investigating:
  - the dentist’s wider leadership role, beyond clinical practice. This includes how dentists, as individuals and as a profession, could play a greater role in informing policy nationally
  - the long term impact of leadership development programmes for dental students
  - students’ perceptions of the importance of leadership abilities and/or their interest in developing leadership skills during dental school, to inform the design of leadership development programmes
  - the impact of structural changes proposed in the recent NHS White Paper, Equity and excellence: Liberating the NHS (Department of Health 2010) upon dentist performance.
References


Department of Health. Equity and excellence: Liberating the NHS Gateway 14385. London 2010


Government response to the Health Select Committee report on dental services. TSO. 2008.


Section 11: Discussion

Limitations of research into factors influencing dental practitioner performance

For many of the domains investigated, the literature on health professionals is heavily dominated by work on doctors. There is thus an obvious need to investigate certain factors in dentistry to a greater extent.

The principal limitations of the research that has been undertaken within dentistry are due to the constraints of self-reported questionnaires. Response rates can vary, and may mean that some factors are under-reported, introducing an element of non-responder bias. There is also the possibility that factors reported by those who completed the questionnaire may vary from those who failed to respond and may reflect what the responder feels should be the answer rather than the actual answer.

In particular, the vast majority of workplace related illness studies are small, cross-sectional, self-reported, with variable or uncertain participation rates, and thus perhaps prone to bias. These studies may also frame questions in such a way that participants are primed to answer that they experience work-related stress. The possibility of reverse causation is rarely considered. Furthermore, many studies are observational in design and the impact of making changes at either the individual or organisational level is largely unknown. Thus the validity of such self-reported questionnaires must be considered.

When undertaking investigations which assess the misuse of drugs and alcohol, anonymity and confidentiality for those completing the questionnaire may be of concern. Respondents may be unwilling to disclose their use of an illegal/stigmatised drug, or excessive consumption of alcohol. Under-reporting may occur as a result. For these reasons, despite assurances of anonymity and confidentiality in these surveys, the data presented are probably representative of a conservative estimate of substance/alcohol use by dentists. This needs to be noted when drawing conclusions and making recommendations.

The timing of studies undertaken in dentistry also needs consideration. Dentistry has undergone, and is about to undergo, significant contractual and structural reform in the last few years. Such fundamental changes will inevitably result in a range of problems, and this could impact the outcome of studies undertaken in advance of, or during this time. This is of particular relevance to factors such as job satisfaction, which must obviously have been affected by the transitional problems of implementing a new contract. Conclusions made from research undertaken during this period needs to take this into consideration, as certain problems may not ever arise again.

Finally, generalisation in drawing conclusions can also be an issue. It is understood how there are particular limitations in drawing conclusions based on differences between cohort groups e.g. drawing conclusions for dentists based on evidence from doctors. There is no evidence to demonstrate distinct similarities between the two professions. However, due to the similarities in the structure of the education programmes and nature of the clinical work, it is reasonable to assume that for certain “general” areas, conclusions, which are applicable to both groups, may be drawn. In many domains, the research was dominated by work undertaken in the field of medicine. Such research could thus serve as a foundation to work on dentistry. Issues may be highlighted which are applicable and relevant for dentistry, thus both identifying specific areas where gaps exist, as well as demonstrating a tested methodology to investigate this area.

Generalisation can also be a problem in small studies which may not have obtained a representative sample, or when there is a lack of uniformity of methodologies and definitions of usage. This is certainly the case in the UK, where there are few studies which are based in, or include, Wales, Northern Ireland or Scotland.

Finally, there are distinct and obvious limitations in developing conclusions from studies based on experience or opinion. Whilst such work may be informative, a distinct lack of scientific foundation may compromise the validity of the findings.
**Moving forward**

A number of areas for further research, in a variety of domains, have been identified. These are summarised, in order of priority in Table 16 below. Where possible, high quality prospective longitudinal studies would take account of reverse causation, and develop more robust associations between chronology and causality. The utilisation of more objective measures in the self-reported questionnaire may also be useful. For example, in investigating burnout, objectively measurable phenomena, such as physiological reactions, could be recorded. However, the implications of the significant time and cost of studies may be a limiting factor.

In the assessment of occupational interventions used within the health care setting, large, well conducted randomised trials, cluster randomised trials, and other robust evaluations to measure the benefits or risks of preventive treatments are required. Such studies must consider a range of relevant outcomes, including symptom reduction, work performance and sickness absence.

It was identified from the stakeholder engagement process that there are significant volumes of non formalised data currently being simultaneously collated by individual organisations including the GDC, Dental Complaints Service, NCAS, NHS Dental Services, Deaneries, Professional Indemnity Societies, etc. Pooling this information could help to generate an understanding of the magnitude of the problem, and may also reveal the source of the problems, i.e. understanding why dentists perform poorly and what can be done to remediate this. The data would need to be formalised to ensure consistency and also broken down into agreed sub-sections. The data collection exercise should not be a one-off exercise, but a continuous activity that is sustainable into the future, which may thus need secured funding. There is also a requirement for a quick turn-around of data e.g. every four to six months where outputs from such a data collection exercise/research and analysis would need to be collated and fed back to the relevant organisations, to ensure that concerns within specific organisations can be identified and addressed immediately.

These organisations are therefore in a strong position to develop a portfolio of research on a variety of factors. Such studies will require an initial investment of research funds, but have the potential both to improve outcomes within the dental own workforce, and to inform policy in other settings.
## Table 16: Summary of suggested research topics in order of priority

<table>
<thead>
<tr>
<th>Domain</th>
<th>Subcategory</th>
<th>Suggested Research Topic Area</th>
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</thead>
<tbody>
<tr>
<td>The impact of work-related factors upon performance</td>
<td>Dental body corporate organisations</td>
<td>▪ The factors which have contributed to the recent growth of dental body corporate organisations in the dental market clinical outcomes and patient satisfaction.</td>
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<tr>
<td></td>
<td>Organisational change</td>
<td>▪ How the impending changes in the organisations of the NHS may impact upon practitioner performance, with particular reference to the recent NHS White Paper, Equity and excellence: Liberating the NHS.</td>
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<tr>
<td></td>
<td>Job satisfaction</td>
<td>▪ An assessment of the levels of job satisfaction in varying clinical settings, particularly in light of its association with stress, a factor which can compromise performance in some individuals.</td>
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<tr>
<td></td>
<td></td>
<td>▪ The factors which affect levels of job satisfaction in varying clinical settings. Dental body corporates, given their recent growth in the dental market, may need specific consideration, as well as those dentists that work in a salaried setting. More general differences between levels of job satisfaction for practitioners working in single-chair and multi-surgery practices should also be considered.</td>
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<tr>
<td></td>
<td></td>
<td>▪ Comparing job satisfaction in dentists working within the NHS, with those delivering private care. This factor is especially pertinent given the continued growth of the private dental sector.</td>
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<td></td>
<td>Self-development and learning</td>
<td>▪ The attitudes towards the development of clinical skills vary according to clinical setting, and further investigations could examine the drivers behind such different attitudes to self-development.</td>
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<tr>
<td></td>
<td>The association between organisational culture and the performance of dentists</td>
<td>▪ Key outcome variables and the identification of the elements and dimensions of culture that are likely to be related.</td>
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</table>
|                                             | Team work, and the deployment of the full range of skill-mixes within a dental team | ▪ It is crucial to understand:  
  ✓ the current levels of utilisation of DCPs within the dental team in general dental practice  
  ✓ the challenges and benefits of implementing the optimal skill-mix workforce, against the feasibility, practicality and desirability of doing so |
within a local practice setting

- barriers to the use of other dental professionals, to include contractual issues, as well as attitudes and perceptions of employing dentists, and logistical implications in terms of facilities, equipment and space
- any differences in retention between members of the DCP team. In general dental practice, dental therapists, hygienists and technicians are commonly self-employed whereas dental nurses are more often employed by a principal. This difference in employment status may mean that those individuals who are self-employed (as opposed to an employee), may feel more in control of their work environment and career
- how best to support dentists in planning a team that is able to serve the needs of the local population most effectively, whilst simultaneously ensuring that services are delivered in the most cost effective and productive manner

<table>
<thead>
<tr>
<th>A consideration of demographic factors</th>
<th>Gender and performance</th>
<th>The impact of gender upon clinical performance, due to the differences in working patterns in women and men, as well as the low numbers of female dentists that return to clinical practice after a break.</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Psychomotor performance and cognitive function</td>
<td>The impact of age and gender upon psychomotor performance and cognitive function.</td>
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</tbody>
</table>
|                                       | Enhancing employment opportunities of female dentists especially after a career break | How to improve the employment opportunities of female dentists especially after a career break.  
What training courses could be implemented to support dentists in returning back to work after a career break? |
|                                       | The differences in communication between male and female dentists | The differences in communication between male and female dentists, when communicating with other members of the dental team, particularly given the increasing influx of young female dentists into the profession. |
|                                       | Ethnicity | The NHS must seek to improve the completeness of equality monitoring data to remove some of the uncertainty around current findings. Ethnicity monitoring of primary care contractors may be required. |
|                                       | Place of qualification | How practitioners qualifying outside the UK should be supported in their clinical work, whilst working in the UK. This is |
particularly important given that the number of dentists originating from EEA countries and from overseas has increased significantly in the last few years.

<table>
<thead>
<tr>
<th>Leadership in NHS dentistry</th>
<th>Leadership skills</th>
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<tbody>
<tr>
<td>Leadership skills</td>
<td>Investigating the differences between the leadership skills of a dental team leader, and the leadership skills required to run a business.</td>
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<tr>
<td></td>
<td>The dentist's wider leadership role, beyond clinical practice. This includes how dentists, as individuals and as a profession, could play a greater role in informing policy nationally.</td>
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<tr>
<th>Leadership development programmes for dental students</th>
<th>The long term impact of leadership development programmes for dental students.</th>
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<tbody>
<tr>
<td></td>
<td>Students’ perceptions of the importance of leadership abilities and/or their interest in developing leadership skills during dental school, to inform the design of leadership development programmes.</td>
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<tr>
<th>The impact of health on performance</th>
<th>Musculoskeletal complaints</th>
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<tbody>
<tr>
<td></td>
<td>The incidence and prevalence of musculoskeletal disorders in dentists.</td>
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<tr>
<td></td>
<td>The psychosocial factors and coping strategies involved in the occurrence and persistence of musculoskeletal complaints.</td>
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<tr>
<th>Prevalence and effects of physical illnesses upon clinical performance</th>
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<tbody>
<tr>
<td>The prevalence of physical illness in dentists, especially neoplastic disease, and how this impacts upon clinical performance.</td>
</tr>
<tr>
<td>The effects of illness on performance as well as attitudes to managing illnesses. Qualitative studies would be especially beneficial.</td>
</tr>
<tr>
<td>Examining the impact of diseases such as tuberculosis, hepatitis C and sexually transmitted diseases (other than HIV) upon clinical performance.</td>
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<tr>
<th>Cognitive impairment</th>
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<tr>
<td>The methods of assessment of cognitive impairment and impact upon clinical practice.</td>
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<tr>
<th>Stress, burnout and other work place related illnesses in dentistry</th>
<th>Causes of stress</th>
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<tbody>
<tr>
<td>Causes of stress</td>
<td>Causes of stress to dentists. This is principally due to the fact that a high percentage of NHS dentistry has been associated with high levels of overall stress in GDPs’ lives.</td>
</tr>
<tr>
<td></td>
<td>An exploration of the factors which cause stress in those practitioners working in different clinical settings, to include the private sector, dental body corporates and the salaried services.</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Impact of stress upon performance</th>
<th>More robust research methods to investigate stress are recommended. Instead of using a self-reported, cross-</th>
</tr>
</thead>
</table>
sectional survey to investigate overall stress, work-stress and health in general dental practitioners, longitudinal studies measuring a group of dentists over time would be more robust. The use of physiological measures (e.g. 24 hour blood pressure monitoring) and biological measures (e.g. salivary cortisol) of stress are also proposed.

<table>
<thead>
<tr>
<th>Alcohol consumption and stress</th>
<th>▪ The relationship between alcohol consumption and stress.</th>
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<tr>
<td>Pressures faced by new graduates</td>
<td>▪ Pressures faced by new graduates, and the effects they may have on performance. The future of new dental graduates has been identified as more uncertain than in the past, generating additional causes of stress.</td>
</tr>
<tr>
<td>Coping strategies</td>
<td>▪ The role of personal attributes in the relationship between working conditions and levels of engagement. Little is known about how dentists manage to cope with their job demands and stay engaged in their work.</td>
</tr>
<tr>
<td>Burnout</td>
<td>▪ Monitoring levels of burnout risk to develop an understanding of the mechanisms that form part of the burnout process in dentists. ▪ Gender related differences in dentist burnout, in a longitudinal design, to overcome the limits of the cross-sectional design. Future research could investigate specific factors such as working hours and age.</td>
</tr>
<tr>
<td>Depression and suicide</td>
<td>▪ Depressive disorders that dentists present with and the possible association with gender, burnout, dental speciality and suicide. ▪ How to encourage clinicians to seek professional help for depressive disorders and other stress related problems. ▪ The incidence, causes and prevention of suicides in order to implement appropriate and effective interventions: ➢ Has the incidence of dental suicides changed over time since the number of female and ethnic minority dentists increased? ➢ Has the character of dental practice changed in recent years? Could this be a factor that has contributed to any change in the prevalence of dental suicides? ➢ Are female dentists more susceptible to stress-related suicide?</td>
</tr>
</tbody>
</table>
Are dentists’ suicides causally related in any way to personal or practice stressors such as divorce or litigation?  
Is there a definable relationship between smoking, caffeine intake or both and suicide? If so, do they affect men and women equally?  
Are the personalities of those who are drawn to dentistry more susceptible to suicidal ideation than those of professionals in other white-collar occupations, as suggested by some studies on doctors?  

<table>
<thead>
<tr>
<th>Smoking and the misuse of drugs and alcohol in dentistry</th>
<th>The misuse of drugs and alcohol in dentistry</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>The prevalence of alcohol and drug misuse in dentistry.</td>
</tr>
<tr>
<td></td>
<td>The factors that cause or sustain alcohol and drug misuse and the impact upon clinical performance and patient care.</td>
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<td></td>
<td>The relative risks of developing addiction problems.</td>
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<table>
<thead>
<tr>
<th>Prevention and management of alcohol and drug misuse</th>
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<tr>
<th>Are psychological factors related to performance?</th>
<th>Understanding the impact of psychological factors upon performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The impact of psychological factors upon clinical performance.</td>
</tr>
<tr>
<td></td>
<td>Exploring the direct impact of failure upon clinical performance, with a focus on the effective management of negative feelings and generating learning outcomes.</td>
</tr>
</tbody>
</table>

| Assessing changes in dentists’ personality traits at different career stages | Psychometric tests are now being used in the application process into some dental schools as part of the selection process. It could be useful to build the results of such tests into a longitudinal study which would assess changes in personality traits at different stages of a dentist’s career, and within different clinical settings/work environments/specialty areas. |  

<table>
<thead>
<tr>
<th>Using personality profiling to develop interventional strategies and career advice programmes</th>
<th>Monitoring the development of personality traits to allow instigation of interventional strategies, should an individual be displaying traits which may predispose to stress and burnout.</th>
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<tr>
<td></td>
<td>Based on the outcome of such work, it could be especially useful to build up a “personality profile” which is able to define the personality attributes of dentists who work successfully in different clinical settings/environments/specialties.</td>
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</tbody>
</table>
Dentists could then be given career advice and guidance depending on the outcome of their personality test.

<table>
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<tr>
<th>The role of education and training</th>
<th>How to support and induct dental practitioners qualifying outside the UK to working in the UK</th>
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<tbody>
<tr>
<td></td>
<td>Differences in dental curriculums across Europe and globally, to identify how dental practitioners qualifying outside the UK could be supported and inducted to working in the UK. This is especially important given the mobility of dental professionals across Europe, and the high number of EEA/overseas qualified dentists working in the UK.</td>
</tr>
<tr>
<td>Undergraduate dental education</td>
<td>How the outcome of education can affect the performance of dentists.</td>
</tr>
<tr>
<td>Dental foundation training programmes</td>
<td>The role and benefits of the dental foundation training programmes, from the point of view of the trainees themselves, as well as their trainers. It would also be useful to examine and compare the varying structures of the programmes that exist, in terms clinical setting, and time in each setting.</td>
</tr>
<tr>
<td>Continuing professional development (CPD)</td>
<td>The uptake of CPD amongst dentists, ensuring a representative sample throughout the UK. Such work should not only examine attendance at courses, but also alternative forms of CPD such as reading professional journals and other activities, in terms of level of uptake and learning outcomes.</td>
</tr>
<tr>
<td>Competency frameworks for dentists with special interests (DwSIs)</td>
<td>Over the past three years, the Faculty of General Dental Practice (UK) and the Department of Health (DH) have been working together to develop a series of competency frameworks for dentists with special interests (DwSIs). There is still little research about the uptake, impact, perceived benefits and learning outcomes of such career pathways.</td>
</tr>
<tr>
<td>Number of years of clinical experience</td>
<td>The impact of the number of years of clinical experience upon performance needs to be examined further. In particular, those dentists who graduated between ten and thirty years ago may be an important cohort to focus upon.</td>
</tr>
</tbody>
</table>
## Appendix A: Search terms

<table>
<thead>
<tr>
<th>Domain</th>
<th>Search Terms Used</th>
</tr>
</thead>
</table>
| **A consideration of demographic factors**       | Demographics  
United Kingdom  
Ethnicity  
Gender  
Female dentists  
Performance of dentists  
Dentist gender and performance  
Dentist gender and poor performance  
Dentist gender and disciplinary measures  
Dentist gender and performance concerns  
Dentist age and performance concerns  
Dentist age and poor performance  
Overseas dentists and performance concerns  
Overseas dentists and poor performance  
Dental profession  
Communication skills  
Culture  
Statistics of dentists in the UK  
Gender differences  
Minority groups in dentistry  
Afro-Caribbean students in dentistry  
Black students /dentists |
| **The impact of health on performance**           | Impairment  
Sick  
General health  
Occupational health  
Physical disabilities  
Dentists with HIV  
Dentists with hepatitis B  
Dentists with hepatitis B  
Dentists with hepatitis C  
Dentists with tuberculosis |
| **Stress, burnout and other work place related illnesses in dentistry** | Stress  
Stressed  
Job demands  
Burnout  
Stress management  
Workload  
Depression  
Suicide  
Dentist stress and performance |
| **Smoking, and the misuse of drugs and alcohol in dentistry** | Drug, substance misuse  
Smoking  
Alcoholism in dentistry  
Workload  
Alcohol consumption  
Drug use  
Dentist alcohol misuse and performance  
Dentist drug misuse and performance |
| **Are psychological factors related to performance?** | Culture  
Psychological factors  
Performance of dentists  
Personality  
Values |
<table>
<thead>
<tr>
<th>Domain</th>
<th>Search Terms Used</th>
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</thead>
<tbody>
<tr>
<td>Interpersonal skills</td>
<td>Behavioural issues, Workload, Personal attributes, Job satisfaction, Dentist clinical errors</td>
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<tr>
<td><strong>The role of education and training</strong></td>
<td>Academic, Dentistry, Dental education, Undergraduate dental education, Postgraduate dental education, Continuing professional development in the UK, Statistics of dentists migrating to the UK, Dentists with special interests, Dental students, Post-qualification training, Vocational Training, Foundation Training, Place of qualification, Complaints in dentistry</td>
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<tr>
<td><strong>The impact of work-related factors upon performance</strong></td>
<td>Communication skills, Complaints, Patients, Dental workforce, Relationship with the dental team, Competence, Team work, Work environment, Performance of dentists, Dental performance and outcome measures, Dentist performance and outcome measures, Disciplinary measures and dentists, Disciplinary measures and dentistry, Dentists and censure, Complaints in dentistry, Dentist clinical mistakes, Dentist appointment times, Management skills, Dental practice, The role of a dentist, Job satisfaction, Working patterns in dentistry, Dental private practice, NHS dental practice, Private dental practice, Public dental practice, Contractual arrangements in dentistry, Dental care professionals, Patient satisfaction, Leadership, Organisational behaviour in dentistry, Retention of dental workforce, Organisational culture in dentistry, Environment in dental practice, Culture in dentistry, Dental materials and equipment, Staff turnover in dental practice</td>
</tr>
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<td>Domain</td>
<td>Search Terms Used</td>
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<tr>
<td>Facilities in dental practice</td>
<td>Facilities in dental practice</td>
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<td>Dental body corporate</td>
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<td></td>
<td>Recruitment of dentists</td>
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<td>Dentist’s experience</td>
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<tr>
<td>Leadership in NHS dentistry</td>
<td>Leadership</td>
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<td></td>
<td>Team work</td>
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<td></td>
<td>The role of a dentist</td>
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</tbody>
</table>
## Appendix B: Stakeholder organisations

<table>
<thead>
<tr>
<th>Organisation</th>
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<tbody>
<tr>
<td>British Dental Association</td>
</tr>
<tr>
<td>General Dental Council</td>
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<tr>
<td>Dental Practitioners Association</td>
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<tr>
<td>Dental Defence Union</td>
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<tr>
<td>Dentists’ Provident Society</td>
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<tr>
<td>Dental Schools Council</td>
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<tr>
<td>NHS Business Service Authority</td>
</tr>
<tr>
<td>Medical Protection Society</td>
</tr>
<tr>
<td>National Clinical Assessment Service</td>
</tr>
<tr>
<td>Manchester University Pharmacology Department</td>
</tr>
<tr>
<td>Western Health and Social Services Board</td>
</tr>
<tr>
<td>The Medical and Dental Defence Union of Scotland</td>
</tr>
<tr>
<td>Dental Public Health Subject Matter Expert from the Netherlands</td>
</tr>
</tbody>
</table>
The National Clinical Assessment Service (NCAS) works with health organisations and individual practitioners where there is a concern about the performance of a dentist, doctor or pharmacist.

We help to clarify the concerns, understand what is leading to them and support their resolution.

Services are tailored to the specific case and can include:

- Expert advice and signposting to other resources
- Specialist interventions such as performance assessment and back to work support.

NCAS uses evaluation, data analysis and research to inform its work and runs a programme of national and local educational workshops.

Contact NCAS

In England, call 020 7062 1655

In Northern Ireland or Wales, call 029 2044 7540

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