STRATEGY FOR ORAL HEALTH RESEARCH IN SCOTLAND

December 2010
Authors

Professor Jeremy Bagg, University of Glasgow Dental School
Professor Lorna Macpherson, University of Glasgow Dental School
Professor Peter Mossey, University of Dundee Dental School
Dr Jim Rennie, NHS Education Scotland
Professor Bill Saunders, University of Dundee Dental School
Miss Margie Taylor, Chief Dental Officer
CONTENTS

Foreword ................................................................. Page 1

1. Background & Introduction ................................ Page 2

2. Recognising Current Strengths ............................... Page 3

3. Implementation Models ........................................ Page 4
   3.1 Areas of potential research synergy between Glasgow
       & Dundee Dental school ...................................... Page 5
   3.2 Area of research for which close interdisciplinary collaboration
       between Glasgow Dental School and the host university is
       recommended ................................................ Page 11
   3.3 Area of research for which close interdisciplinary collaboration
       between Dundee Dental School and the host university is
       recommended ................................................ Page 12
   3.4 Identified areas of strength with potential for national
       Collaboration .................................................... Page 13

4. Infrastructure to support clinical trials in Oral Health Care
   Research ............................................................. Page 15

5. Management Issues ................................................ Page 17
FOREWORD

Oral health research in Scotland has many strengths. This was made clear in the external review of Oral Health Research in Scotland by Professors Speight and Shaw, to whom I am very grateful for setting us such a positive direction of travel.

This new strategy seeks to build on those strengths and takes things forward in a new and exciting way. We must further build on the positive aspects of our existing research, enhancing the reputation of the Scottish research community whilst always ensuring that our research efforts support the needs of the Scottish population.

The strategy recognises that by being cohesive, co-operative and collaborative, the oral health research community can bring benefits to the health and wellbeing of many people in Scotland and beyond and be better placed to submit high quality proposals for research funding both nationally and internationally.

This collaborative approach takes many forms – between dental schools, between dental schools and their host institutions and finally between dental schools and the wider NHS community. Each level of collaboration will enhance the research output and offer best use of research resources.

I would like to thank the oral health research community in Scotland for contributing to this vision, with special thanks to the members of the Oral Health Research Advisory Group for bringing the strategy together. I believe we can realise the collaborative vision described in the strategy and I look forward to very positive developments in the years to come.

CHIEF DENTAL OFFICER
STRATEGY FOR ORAL HEALTH RESEARCH IN SCOTLAND
IMPLEMENTATION DOCUMENT

1. Background and Introduction

In 2008, prior to the release of the outcome of RAE 2008, the Scottish Government, through the offices of the Chief Scientist and the Chief Dental Officer, commissioned a review of oral health research in Scotland. The timing coincided with the withdrawal, by the CSO, of core funding for the Dental Health Services Research Unit. The review was undertaken by Professors Paul Speight (University of Sheffield) and Bill Shaw (University of Manchester).

Following receipt of the report of the external Scottish Research Review, the Chief Dental Officer convened a preliminary meeting in June 2009 of Dental Deans / Heads of Scottish Dental Schools / Institutes, together with the Directors of Research for Dundee and Glasgow Dental Schools, to discuss the implementation of its recommendations. One outcome of the meeting was to develop a strategy for oral health research in Scotland which would be informed by the observations in the report, and would have three broad objectives:

- To ensure that research that was undertaken would support the needs of the Scottish population.
- To focus and build on areas of research in which Scottish scientists are already at the forefront of UK and international oral health research efforts.
- To enhance the reputation of dental research in Scotland by optimising performance in national peer reviewed research appraisal.

These objectives are mutually supportive and an appropriate strategy should seek to deliver them simultaneously.

An outline strategy document was prepared by Professors Jeremy Bagg (University of Glasgow) and Peter Mossey (University of Dundee), as a framework for further discussion by key stakeholders. Following discussions by the CDO Group in December 2009, at which the broad principles were accepted, it was agreed that the next stage was to develop a focused oral health research strategy and an implementation plan taking into account the issues raised in those discussions and the feedback from an external research review (ERR) of Dentistry at the University of Dundee. The outcome is this definitive strategy document that identifies clear mechanisms through which the necessary collaborations, both national and international, can be facilitated and managed. The strategy is consistent with the Chief Scientist Office health research strategy (Investing in Research, Improving
Health, Scottish Government, 2009) in its emphasis on international excellence, population benefit and translation. It is proposed that implementation of the strategy will be overseen by a national Steering Group (see Section 5).

2. Recognising Current Strengths

To be successful on the international stage, modern biomedical and healthcare research requires academic expertise, together with significant financial and infrastructural resources. Whilst the feedback from the Dentistry Sub-Panel of RAE 2008 was generally complimentary about the quality of much of the dental research undertaken in the UK, it also pointed out the dangers for individual dental schools of trying to undertake research in too many subject areas, without clear focus. The feedback also stressed the importance of critical mass, collaboration and interdisciplinary working if UK dental research is to continue to advance, together with the importance of demonstrating relevance of research outputs to society, and the value of applied and translational research. A number of these issues were identified in the ERR undertaken recently at Dundee Dental School and have been given serious consideration in the recent revision of the Research Strategy for Glasgow Dental School. The heavy teaching and clinical workloads of many dental academics is a further important factor when considering the scope of research activity.

The immediate goal for future oral health research in Scotland is to identify clearly those areas that should be strengthened and those in which we should dis-invest. It is also critical that we collaborate, where appropriate, with other disciplines, particularly in laboratory-based biomedical science. If we do this successfully in a co-ordinated fashion across Scotland, then this should allow us to build sufficient capacity in these focused areas to be able to respond to calls for grant funding applications either locally or internationally.

Following announcement of the RAE 2008 result, both Dundee and Glasgow Dental Schools have been refining their research strategies. The two Schools are now collaborating closely, to ensure that there is synergy and a sharing of expertise that will help both institutions to deliver research outputs relevant to the Scottish population and enhance their positions and research reputations within the UK and internationally. Collaboration will also produce a strong core of research experts able to interact with other dental researchers in both primary and secondary care settings.

The key principles underlying the ongoing process between the Schools are as follows:

- Recognition of, and support for, current research strengths, with active dis-investment in areas that are not producing high quality outputs and / or are not financially viable.

- Focus on productive and interdisciplinary collaborations at all levels.

- Consideration of research collaboration in areas of oral health research in Scotland where there are clear synergies.
• Maximising the involvement of existing interdisciplinary networks e.g. CLEFTSiS and primary care networks e.g. SDPBRN, Childsmile, TRiaDS.

• Increasing the capacity of research studentships.

Against the backdrop described above, and following the ERR at Dundee Dental School, there is evidence to support inclusion of the following research themes in a list of areas of particular strength in oral health research in Scotland:

- Craniofacial anomalies particularly cleft lip and palate.
- Dental public health / health services research.
- Microbiology and immunology – basic and applied research.
- Oral cancer.
- Dental education research.

3. Implementation Models

There are a number of ways by which critical mass can be increased and interdisciplinary working optimised. For the five areas identified above as current strengths in Scotland, the following models are recommended for consideration:

- Identified areas of potential research synergy between Glasgow and Dundee Dental Schools
  - Craniofacial anomalies
  - Dental public health / health services research

- Area of research for which close interdisciplinary collaboration between Glasgow Dental School and the host university is recommended
  - Microbiology and immunology - basic and applied

- Area of research for which close interdisciplinary collaboration between Dundee Dental School and the host university is recommended
  - Oral cancer

- Identified area of strength with potential for national collaboration
  - Dental education research

The following sections describe in detail the proposed mechanisms for implementation of these models.
3.1. Areas of Potential Research Synergy between Glasgow and Dundee Dental Schools

This section describes the two areas of research activity currently ongoing within the individual Dental Schools of Glasgow and Dundee, for which closer collaboration could potentially provide real benefit. However, it should be noted that there already exist strong collaborations for each group with other researchers in their host Universities (e.g. the Public Health Unit at the University of Glasgow and the Health Informatics Centre at the University of Dundee) and with external collaborators, which should continue unhindered regardless of the closer collaboration between the two dental schools.

3.1.1 Craniofacial Anomalies / Cleft Lip and Palate

In the RAE 2008 submissions, research into craniofacial anomalies (CFA) was highlighted as a leading research theme in both Dundee and Glasgow. Importantly, the specific aspects of the research in this field at the two centres are different but highly complementary.

Dundee University hosts one of only two WHO collaborating centres for craniofacial anomalies in the world. There is a track record of cutting edge research not only in Scotland but also internationally and Dundee has contributed to a number of very significant breakthroughs in the aetiology of cleft lip and palate, both genetic and environmental, with a high impact and translational potential. Successful European and NIH applications have brought significant resources to Scotland e.g. European Framework programme funding, funding channelled through the WHO and funding for an international collaborative randomised surgical trial in isolated cleft palate that is about to commence.

The 3D imaging research at Glasgow Dental School has yielded over £1 million in research funding. Advanced technology has been developed to assess objectively, by 3D imaging, the facial deformities present in children and infants born with cleft lip and palate and in adult patients with dentofacial malformations. The main objectives are to characterise, in a statistically reliable and objective manner, residual facial deformities following cleft repair, to improve surgical planning, to develop haptic methods for surgical rehearsal of orthognathic surgery, and to measure surgical outcomes. Technological advances are moving this work into the fourth dimension, enabling measurement of movement over time (4D). The craniofacial research team has been well organised, productive and favourably reviewed.

Scotland also boasts an exemplary Managed Clinical Network in cleft lip and palate and has set up a clinical governance system that is an example for other units in the UK and beyond.

An over-arching Craniofacial Anomalies Research Strategy should be developed for Scotland, which can be implemented locally, nationally and internationally.
3.1.1.2 Local Strategy

Use the significant resources in terms of facilities and expertise that we have at our disposal in Dundee and Glasgow to:

Establish formally a **Scottish Craniofacial Anomalies Research Group** which would:

Meet regularly to discuss and plan the research programme in a mutually acceptable fashion that exploits existing strengths, e.g. projects that require complementary input such as genotype-phenotype correlation.

Ensure that time and effort are invested in projects most likely to be productive / fundable, and inform disinvestment in other areas where there is less likelihood of being competitive or where the research is less likely to have translational impact.

Deliver joint peer review in the assessment of proposals being developed for research grant funding, supporting the submission of high quality collaborative applications for cutting edge research grant funding to local as well as national and international funding bodies.

Deliver joint peer review of manuscripts for publication, ensuring continuation of the current good track record of publishing in the highest impact peer reviewed journals in the field.

Increase research capacity and critical mass by recruitment of new staff or by attracting existing staff into the field of craniofacial anomalies research.

Offer research studentships in the field of craniofacial anomalies research.

Provide opportunities for craniofacial anomalies research through taught Masters and intercalated degree programmes.

3.1.1.3 National Strategy

Use the Managed Clinical Network in Scotland (CLEFTSiS) as a unique system for carrying out Scotland-wide multi disciplinary research.

Utilise the unique CHI System for research in which record linkage enables access to at least three generations of linked
data which may be relevant to the issue of cleft lip and palate research.

Continue to nurture the links and good relations that researchers in CFA in Scotland have with their colleagues in the UK, particularly Manchester, Liverpool and Bristol, and also be pro-active in the inclusion of partners in the rest of the UK in projects where their input adds value to research proposals.

Identify and develop a relationship with potential funders of CFA research in the UK such as the MRC, NIHR, Trials and Studies Coordinating Centre (EME), SPARKS and the Healing Foundation.

The Healing Foundation has pledged funding for the infrastructure to support inter-disciplinary multi-centre collaborative research in cleft lip and palate in the UK by funding a centre of research excellence and accompanying biobank to facilitate future research in the UK and to make the UK a more attractive partner in international collaborative studies. There is a need to continue negotiation with colleagues involved in the Healing Foundation funded initiative on how expertise in Scotland can be brought to bear on a major genotype-phenotype correlation project in the UK.

Be pro-active in seeking opportunities to raise the profile of Scotland as a partner with research expertise in the craniofacial field by holding or hosting national and international craniofacial or cleft lip and palate meetings/conferences.

Maintain an international profile by accepting invitations to present at international conferences and meetings.

3.1.1.4 International Strategy

CFA research in Scotland is significant at a global level in that isolated cleft palate is disproportionately prevalent in Scotland compared with other countries in the world (with the exception of Finland) and therefore research into aetiological factors carried out in Scotland carries a special significance.

In terms of strategy, it is apparent that Scotland is capable of leading in aspects of national and international CFA research, and such opportunities are already being pursued pro-actively. These activities provide an insight into global priorities and strategies, and facilitate identification of strong collaborative partnerships for future research and translational activities.

Between November 2000 and December 2004 a series of consensus meetings to address the global research challenges
of craniofacial anomalies was coordinated through the WHO Human Genetics Department. This resulted in the issuing of recommendations and the creation of two WHO collaborating centres for research in CFA, one of which is hosted by the University of Dundee. Maintaining this WHO collaborative status must be prioritised.

It is now acknowledged that CFA is a global problem and following the discussions at the 2007 World Health Assembly (WHA) it has become one of the non communicable diseases (NCDs) that has been targeted by the WHO in their strategic „global burden of disease’ (GBD) project. The CFA project as a component part of this GBD project was formally launched in May 2009 and is being led by Professor Mossey in Dundee.

Another strategic initiative by the International Association for Dental Research (IADR) has resulted in a collaborative effort along with FDI and WHO to address „global oral health inequalities’. CFA is one of the areas of oral health inequalities to be addressed as part of this initiative and Scotland can play a leading role in the co-ordination of research that underpins these global efforts.

3.1.2 Dental Public Health and Health Services Research

The Community Oral Health Research Group in Glasgow has developed a significant reputation through its portfolio of research activities on inequalities in oral health care. As the academic centre responsible for evaluation of the national Childsmile programme, it is already performing a key role in public health research of direct relevance to the Scottish population. University investment in the staffing infrastructure of this group has resulted in an academic unit that has a broad spread of the relevant skills and which already interacts with a wide range of academics both nationally and internationally.

Dundee Dental School and the Dental Health Services Research Unit have gained a significant reputation in Dental Health Services Research. The recent external research review of dentistry at the University of Dundee recognised the distinguished, high quality research being undertaken by the Unit. Their work aims to inform the needs of the Scottish population. A particular strength is dental cariology and this work has international implications. This includes lead roles in the FDI Global Caries Initiative and the IADR Global Inequalities Task Group. The model whereby a dedicated research unit interacts with clinicians in dental health services research is potentially a very effective strategy for research and in recent times has been a productive one, with the capacity to respond to Scottish and UK national research initiatives (e.g. NIHR Fiction and Interval Trials). Combined with clinical trials capacity and expertise at the University of Dundee (e.g. the Health Informatics Centre (HIC)) this promises to be an effective strategic area into the future.
Thus, Scottish academics in Glasgow and Dundee are already at the international forefront of research in aspects of dental public health and health services research. In some areas there is commonality, whilst in other areas the skill bases are different but complementary. The pooling of expertise in those areas of activity where there are complementarities, for example the prosecution of large randomised controlled trials within the framework of the overall evaluation of complex health interventions such as Childsmile, and the implementation of practice based research via the Scottish Dental Practice Based Research Network (SDPBRN) / Translational Research in a Dental Setting (TRiaDS) / Childsmile could produce an extremely strong research team, to the advantage of Scotland and both dental schools.

**Dental Public Health/Dental Health Services Research Strategy**

Establish a Scottish Dental Public Health and Health Services Research Group.

Ensure that research themes align with priority oral health issues for Scotland with output likely to impact directly on population health and the delivery of health services.

Utilise the expertise of the researchers in Glasgow and Dundee to develop further the evidence base for oral health improvement through population-based programmes.

Ensure that time and effort are invested in projects most likely to have impact and to be productive / fundable, and inform re-direction from other areas where the research is less likely to have translational impact or where there is less likelihood of it being competitive.

Continue to embed research within NHS structures and organisations.

Expand the knowledge base in dentistry in Scotland relating to the evaluation of complex population-based health interventions.

Utilise the emerging measures of health inequality to inform progress on better understanding and addressing oral health inequalities in Scotland.

Use longitudinal programmes such as Childsmile to promote translation of biological discovery into clinical application. For example, establish a population-based resource to allow study of the influence of factors such as socioeconomic status, behaviours and subject-based biological variables on disease causation and outcome.

Build on partnerships and research structures within Head and Neck Cancer Managed Clinical Networks in Scotland to facilitate the prosecution of Scotland-wide multidisciplinary research in clinical epidemiology.
Continue to nurture the links and good relations (within academia, the NHS, and beyond) that researchers have developed in Scotland and the rest of the UK in projects where their input adds value to research proposals.

Seek funding for research studentships in the field of dental public health / dental health services research for study in identified research priority areas.

Be pro-active in seeking opportunities to raise the profile of Scotland as a partner with research expertise in the dental public health / dental health services research field by holding or hosting national and international meetings / conferences.

Maintain an international profile by accepting invitations to present at international conferences and meetings.

Build on existing collaboration between the research groups in Dundee and Glasgow in the following areas:

TRiADS/Childsmile interaction:

Meet regularly to discuss and plan research programmes in a mutually acceptable fashion that exploits existing strengths.

Develop collaborative proposals for research grant funding which align with focused priority areas. Promote the submission of high quality collaborative applications to local, national and international funding bodies.

Identify and develop a relationship with potential funders such as the MRC, NIHR, CSO.

Produce manuscripts for publication, encouraging joint publications in high impact peer reviewed journals in the field.

Dental informatics:

Via the Dental Informatics Group, NHS National Services Scotland, utilise the CHI (Community Health Index) number - unique patient identifier in all primary health care activities, and in hospital based clinical information systems – as the key to linking health data for research purposes. Pooled record-linkage projects are already being developed as part of the NES Workforce – Childsmile project and the Childsmile evaluation has many projects underway.
Collaborate on systematic reviews, including Cochrane reviews.

3.2. Area of Research for which Close Interdisciplinary Collaboration between Glasgow Dental School and the Host University is Recommended

Microbiology and Immunology

Much oral disease has a microbiological and/or immunological aetiology and many dental schools have strong research groups in this area. Traditionally, Glasgow Dental School has had a strong reputation in microbiology, including clinically applied microbiology e.g. infection control, instrument decontamination and antibiotic resistance. Over the past three years the Infection & Immunity Research Group has enhanced its profile through the appointment of key individuals with expertise in both microbiology and immunology. This has provided increased levels of support for existing academic staff members whilst creating a multidisciplinary research environment, which has been the catalyst for the enhancement of postgraduate research student recruitment. In addition, strong external collaboration with the NHS in Scotland and with industrial sponsors, both nationally and internationally, has underpinned and enhanced the Group’s output.

The current core bench science research activities map closely onto Immunity and Infectious Disease funding streams of both the Wellcome Trust and Medical Research Council, as well as playing a key role in shaping policy decisions by the Scottish Government. Oral health care costs NHS Scotland £404M per year, of which infectious oral diseases are responsible for considerable morbidity and socioeconomic burden. As the Infection & Immunity Group has evolved, its focus has become the management of infections of biofilm origin, a theme that is central to oral health and disease. Two distinct avenues of research are being pursued:

- How the host immune system controls biofilms within the oral cavity.
- How chemotherapeutic approaches can be used to reduce and eradicate biofilms of oral origin.

The Group recognises that it is impossible to undertake leading edge research in this dynamic area in isolation, and has a policy of close research interaction with the Inflammation, Infection & Immunity Division of the University of Glasgow Medical Faculty, including shared use of laboratory space and academic staff appointments to act as bridges between the two Divisions in the Faculty. Furthermore, there are research collaborations with other areas of the University of Glasgow and externally.

Whilst there is less scope than described for the research theme areas in Section 3A for a strong synergistic alignment of alignment of infection and immunity research between Glasgow and Dundee Dental Schools, the major
interest of the cariologists at Dundee in biofilms suggests a possible area of interaction that would be worthy of further exploration.

3.3. Area of Research for which Close Interdisciplinary Collaboration between Dundee Dental School and the Host University is Recommended

Oral Cancer

Oral cancer is the sixth most common cancer globally and the incidence is rising in Scotland, especially amongst younger people. Despite improvements in the treatment of this disease, survival rates for oral cancer have not improved over the past three decades and five year survival is around 50%.

Dundee University, through the Colleges of Life Sciences (CLS) and Medicine, Dentistry and Nursing (CMDN), has established a major interest and is regarded as world leader in cancer research. The recent launch of the Cancer Research UK (CRUK) - supported Dundee Cancer Centre (DCC) presents an ideal opportunity for the Dental School to establish a laboratory base for a national bio molecular oral cancer research programme and to co-ordinate clinicians, scientist and patients to produce a centre of research excellence. This was recognised by the External Research Review (ERR) of Dentistry in Dundee (January 2010) which recorded “strengths in oral cancer research with the potential to build strong partnerships with the excellent cancer research groups in the College and the wider University”.

The strengths, track record and future potential in oral cancer research in Dundee surround the following three themes:

**Screening, diagnosis and prognosis** and in particular identification and quantification of diagnostic and prognostic markers related to cancer progression.

**Molecular mechanisms of cancer development and progression.** This would involve signal transduction pathway research and cell migration which may have implications not only for oral cancers but a range of other types of malignancy.

**Translational aspects**: Ongoing research is also aimed at new inhibitors that could be used in early phase clinical trials. The expertise available through the newly established clinical trials unit of the Clinical Research Centre in Dundee could support future clinical trials. Tissue engineering and bone remodelling projects are also underway through doctorate programmes in the Dental School and the facilities and expertise exist for angiogenesis research using in vitro models and possibly testing for stimulators and inhibitors in a controlled environment.

Cancer research in Dundee would receive support from NHS Maxillofacial, Oral Medicine and ENT consultant colleagues, as well as an oral pathologist.
and general pathologists in the Medical School. The Dental School has state-of-the-art laboratory facilities that could become an integral part of the Dundee Cancer Centre. The overall objectives in research in oral cancer in Dundee would be to:

- Pursue ongoing interests in molecular aspects of cancer research.
- Contribute to Scotland-wide initiatives in oral cancer as a dental public health issue, which would articulate with ongoing research into the epidemiology of oral cancer currently being pursued by the Community Oral Health Research Group at Glasgow Dental School (see above).

3.4. Identified Area of Strength with Potential for National Collaboration

Educational Research

Educational research in dentistry is being undertaken by a number of academic and NHS stakeholders across Scotland and should be considered a core strategic theme. The scale of investment and critical mass of expertise is currently greatest within NHS Education for Scotland (NES), but the dental schools have a declared interest in pursuing and developing this theme into the future, in collaboration with NES.

NHS Education for Scotland

Scotland is uniquely placed in relation to the delivery of dental education and assessment of novel methodologies and technologies, because of the forward-thinking and substantial input of NES. Whilst the impact and influence of the Dental Directorate of NES has been directed primarily at postgraduate education and training, the support of new initiatives in undergraduate education through availability of ACT (D) uplift funding has been of great benefit. Furthermore, recently introduced, innovative national programmes funded by NES, such as the Confederated Learning Environment Online (CLEO) and the Work Programme for 2D and 3D Digital Visualisation, both of which will deliver high quality interactive educational content, provide an extremely fertile environment for high quality educational research. In addition to the support and infrastructure provided by NES, involvement in educational research activities is already ongoing at several levels within Scottish dentistry, as follows:

Primary Care

Under the guidance of NES, dental educational research in primary care has evolved significantly in recent years. For undergraduates, the experience of outreach teaching is proving an exceptionally popular and successful mechanism for delivering education, though there is ample scope for further educational research to provide objective evidence for its effectiveness. The delivery of education within VT and GPT is another example of primary care
education, within which the effectiveness of new teaching and assessment methods has been subject to investigation by NES, but is an ongoing process. For those in independent practice, there are educational issues linked to delivery of CPD but also the impact of clinical guidance documents on clinical practice. The latter is being actively investigated by the Scottish Dental Clinical Effectiveness Programme (SDCEP) through its TRIADS Project. One further advantage for Scotland is the existence of the Scottish Dental Practice Based Research Network (SDPBRN), which provides an existing infrastructure to support a variety of types of primary care research, including educational research.

**University Research Groups**

The University of Glasgow Dental School has now formally established a Dental Education Research Group, which will function as a partner with the Centre for Educational Scholarship within the Faculty of Medicine. The Group, which is in its early stages of development, will provide a focus for the variety of small projects in this theme that are already underway at Glasgow Dental School, but its longer term focused strategy, which is still being finalised, will concentrate on assessment of digital interactive media in dental education. This work will be fed by outputs from the ongoing CLEO project and the collaboration between the University of Glasgow’s Dental School, Faculty of Biomedical & Life Sciences and the Glasgow School of Art Digital Design Studio, that will produce very high quality digital learning materials. Dundee Dental School is also a partner in the latter two projects, providing a cohesive integrated grouping between NES and the Scottish Universities and NHS Highland.

Educational research within Dundee Dental School falls within the strategic remit of those involved in the scholarship of learning and teaching. Building on a proven track record the focus of the educational research strategy is on formative and summative assessment within healthcare education, including the development and evaluation of OSCE, SCOT, and ESCOT methodologies and looking to development of novel assessment methodologies, including work in the challenging field of professionalism and ethics in healthcare. This research group has developed, piloted and validated an on-line tool to assess individual students’ understanding of professional behaviour, but also allowing each student to identify where their responses lie with regard to their peers, their teachers and the general public. This tool will be used longitudinally to determine how students develop professional attributes throughout their University experience, but also across other universities in Scotland, the UK and overseas. There is also interest from other professional groups, such as law and the careers development service, to roll this tool out in other areas. Collaboration with colleagues in the College of Medicine, Dentistry and Nursing, including the Centre for Medical Education, is central to the strategy and discussions have taken place between the Dental School and NES to develop themes for educational research extending from the undergraduate years into the early postgraduate years.
Implementation of this element of the Oral Health Research Strategy for Scotland requires:

- Development of an over-arching **Dental Education Research Strategy** for Scotland.

- Establishment of a **Scottish Dental Education Research Group** which would:
  
  Meet regularly to discuss and plan the research programme in a mutually acceptable fashion that exploits existing strengths, e.g. links into current developments in e-learning.

  Ensure that time and effort are invested in projects most likely to be productive / fundable.

  Deliver joint peer review in the assessment of proposals being submitted for research grant funding, supporting the submission of high quality collaborative applications for research grant funding to local as well as national and international funding bodies.

  Deliver joint peer review of manuscripts for publication, ensuring publication of outputs in the highest impact peer reviewed journals in the field.

  Development of strong articulation with researchers in related fields, particularly those with expertise in educational and qualitative research.

  Increase research capacity and critical mass by recruitment of new staff or by attracting existing staff into the field of educational research.

  Offer research studentships in the field of educational research.

4. **Infrastructure to Support Clinical Trials in Oral Health Care Research**

The preceding sections of this document relate to subject-specific aspects of the development of an Oral Health Research Strategy for Scotland. However, one generic and integral element of the infrastructure that currently requires significant strengthening is the capacity and resource to run high quality, multi-centre clinical trials. This capability would be of key relevance to all of the research themes identified for potential pooling and would help to reverse the current decline in clinical research within UK dentistry that was identified in the report of the RAE 2008 Sub-Panel.

The following points require consideration:

Many aspects of dental clinical practice still lack a robust evidence base and therefore an aspect of research that is being targeted by national and international funding bodies is clinical trials.
Incorporation of a mechanism to facilitate clinical trials in our focused areas of research activity would require close co-operation with the NHS and should aim to include nationwide initiatives involving primary care dentists throughout Scotland. This would be helped by the pre-existing Scottish Dental Practice Based Research Network (SDPBRN) and the infra-structure of the Childsmile Programme. The development of tracker practices across Scotland would further facilitate this research activity.

The Dental Informatics Group (NHS, National Services Scotland) can facilitate access to Scotland’s rich datasets. The Community Health Index (CHI), used as a record linkage system to store human population data, represents a valuable tool for hypothesis generation or to underpin the case for investigating a particular issue or clinical problem, thereby informing the establishment of clinical trials.

The Glasgow Clinical Trial Unit (GCTU) is a long-established organisation that can support every aspect of a clinical trial with specialist services being provided by the Robertson Centre for Biostatistics, Glasgow Clinical Research Facility, and Greater Glasgow & Clyde NHS R&D. The GCTU can support both academic and commercial studies and can provide recruitment & follow-up of patients, trial management and monitoring, data management & biostatistics, web portals facilitating e-trials, training, or indeed a "full service" support.

The University of Dundee has recently established a clinical trials unit (CTU) supported by a multi-million pound clinical research centre ("research hotel"). This facility passed an MHRA inspection in September 2009 and also has the potential to support clinical trials related to oral health.

Ongoing activities such as the TRIADS project, which aims to translate research into clinical practice, the allied project entitled Getting Research into Practice (GRIP), and the Childsmile Programme would be able to evolve and expand if appropriate clinical trials support were available.

It is important that the oral health research community interacts positively with the UKCRN/NIHR Specialty Groups. Despite the current difficulties in interaction between England and the devolved nations, for example in the sharing of trial accrual data, establishment of Scottish specialty groups within the three focused areas outlined in this strategy will place us in a stronger position to interact when the national difficulties have been resolved.
5. **Management Issues**

The existing, established research groups and networks identified in this strategy will continue to operate their standard local management procedures within their individual organisations. However, for the three themes where there is a recognised need for improved joint working, national groups will be established:

- Scottish Craniofacial Anomalies Research Group
- Scottish Dental Public Health and Health Services Research Group
- Scottish Dental Education Research Group

The management of the strategy will be overseen at a national level by a Steering Group, established by the Chief Dental Officer for Scotland. Membership of the Steering Group will be as follows:

<table>
<thead>
<tr>
<th>Post / role</th>
<th>Representative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chief Dental Officer (Chair)</td>
<td>Miss M Taylor</td>
</tr>
<tr>
<td>CSO representative</td>
<td>Dr H Lapsley</td>
</tr>
<tr>
<td>Head of Glasgow Dental School</td>
<td>Prof J Bagg</td>
</tr>
<tr>
<td>Director of Dental Research, Glasgow Dental School</td>
<td>Prof L Macpherson</td>
</tr>
<tr>
<td>Head of Dundee Dental School</td>
<td>Prof WP Saunders</td>
</tr>
<tr>
<td>Director of Dental Research, Dundee Dental School</td>
<td>Prof P Mossey</td>
</tr>
<tr>
<td>Postgraduate Dental Dean</td>
<td>Dr JS Rennie</td>
</tr>
<tr>
<td>Primary Care Research representative</td>
<td>Prof J Clarkson</td>
</tr>
<tr>
<td>Head of Edinburgh Postgraduate Dental Institute</td>
<td>Prof R Ibbetson</td>
</tr>
<tr>
<td>Head of Aberdeen Dental School</td>
<td>Prof J Newton</td>
</tr>
</tbody>
</table>