

# Dentistry

## Subject benchmark statements

*Subject benchmark statements* provide a means for the academic community to describe the nature and characteristics of programmes in a specific subject. They also represent general expectations about the standards for the award of qualifications at a given level and articulate the attributes and capabilities that those possessing such qualifications should be able to demonstrate.

This *Subject benchmark statement* does not address explicitly the level at which the qualifications for dentistry might be placed within either *The framework for higher education qualifications in England, Wales and Northern Ireland* or *The framework for qualifications of higher education institutions in Scotland* (the *frameworks*). However, the *statement* includes expressions of the professional/employment related abilities that graduates in dentistry would be expected to have developed during their higher education and associated practice based experiences. These align, albeit with an emphasis on 'professional ability', with the abilities expressed in the Masters degree descriptor included within the *frameworks*<sup>1</sup>.

*Subject benchmark statements* are used for a variety of purposes. Primarily, they are an important external source of reference for higher education institutions when new programmes are being designed and developed in a subject area. They provide general guidance for articulating the learning outcomes associated with the programme but are not a specification of a detailed curriculum in the subject. Benchmark statements provide for variety and flexibility in the design of programmes and encourage innovation within an agreed overall framework.

*Subject benchmark statements* also provide support to institutions in pursuit of internal quality assurance. They enable the learning outcomes specified for a particular programme to be reviewed and evaluated against agreed general expectations about standards.

Finally, *Subject benchmark statements* may be one of a number of external reference points that are drawn upon for the purposes of external review. Reviewers do not use *Subject benchmark statements* as a crude checklist for these purposes however. Rather, they are used in conjunction with the relevant programme specifications, the institution's own internal evaluation documentation, in order to enable reviewers to come to a rounded judgement based on a broad range of evidence.

The benchmarking of academic standards for this subject area has been undertaken by a group of subject specialists drawn from and acting on behalf of the subject community. The group's work was facilitated by the Quality Assurance Agency for Higher Education, which publishes and distributes this *statement* and other *statements* developed by similar subject-specific groups.

In due course, but not before July 2005, the *statement* will be revised to reflect developments in the subject and the experiences of institutions and others who are working with it. The Agency will initiate revision and, in collaboration with the subject community, will make arrangements for any necessary modifications to the *statement*.

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<sup>1</sup>Please refer to additional supplementary statement: <http://www.qaa.ac.uk/crntwork/benchmark/supstat.htm>

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# Academic standards - Dentistry

## Preface

This *Subject benchmark statement (statement)* describes the nature and standards of an undergraduate programme in dentistry (BDS or BChD). It is part of a more widespread process, under the aegis of the Quality Assurance Agency for Higher Education (QAA), to provide benchmark standards that can be used particularly in the course of academic review, and as an aid to external examiners.

The *statement* has been drafted by a group of 13 academic staff drawn from each of the dental schools teaching undergraduate students, attached to universities in England, Northern Ireland, Scotland and Wales. The group represents a wide range of specialties and academic interests, and was formed, at the request of the QAA, by the General Dental Council (GDC) on the recommendation of the individual dental schools.

The group considered, and took account of, an overarching health professions framework produced and agreed by other groups benchmarking standards in health care subjects (<http://www.qaa.ac.uk/cmtwork/benchmark/nhsbenchmark/letter.htm>). This framework illustrates, on the one hand, the shared basis upon which the education and training of health care professionals rests and, on the other hand, the uniquely profession-specific contexts within which undergraduate programmes are organised. The format of the *statement* seeks to reflect these two dimensions and the professional context within which the graduate will be employed. It highlights the relationship with the professional and regulatory competent authority (GDC). It describes the integration of the generic, scientific, medical and dental components of the educational structure.

On graduation dental students should have developed a holistic view of patient care, accept their professional responsibilities, and acknowledge their limitations. They should have demonstrated an appropriate level of competence to deal with complex issues both systematically and creatively, make sound judgements on the basis of available data, and have acquired a commitment to continuing professional development.

The *statement* does not set a national curriculum for programmes leading to awards in dentistry. It acknowledges that the requirements of the professional and regulatory body and the standards set out in this *statement* need to be incorporated into the design of programmes, but beyond that it allows for local innovation, development and flexibility in the overall design of the curriculum. Its essential feature is the specification of threshold standards, incorporating academic and practitioner elements, which ensure the graduating dentist is fit for independent practice, as required by the GDC. It provides guidance within which higher education institutions are expected, as a minimum, to set their standards for the award.

The main sections of the *statement*, in addition to describing the general nature and extent of programmes leading to awards in dentistry, describe the profession-specific expectations and requirements which characterise the profession. The statement illustrates the broad expectations of the practitioner as a professional and describes the need for a systematic acquisition of knowledge, a comprehensive understanding of techniques and a critical awareness of current knowledge, skills and attitudes.

*Subject benchmark statements* provide reference points rather than specifying outcomes and are expository rather than prescriptive. Institutions in their programme specifications will provide information on the structure and functions of their particular programme of study and specify learning outcomes. The yardstick for the graduate in dentistry is the ability to apply for registration with the General Dental Council and to practise without supervision. The *statement* for dentistry is but one of a number of external reference points for the undergraduate dental curriculum and must be considered together with the others, and in particular the recommendations of the General Dental Council published in '*The First Five Years*'.

This *statement* also includes a section on teaching, learning and assessment. It draws attention to the central role of practical experience in the design of learning opportunities for undergraduates and the importance of ensuring that professional competence developed through practice is adequately assessed and rewarded. It also notes how essential it is that the integration of theory and practice is a planned process within the overall arrangements made for teaching and learning.

This *statement* on standards accords with the relevant level descriptor for awards in the qualification framework proposed by the QAA.

## Introduction

The GDC regulates the practice of dentistry through Acts of Parliament. As a result, the GDC provides guidance to universities and other dental authorities that award degrees and licences on the design and implementation of programmes of study. Consequently, this *statement* recognises the primacy of the GDC requirements for registration outlined in the publication *The First Five Years - The Undergraduate Dental Curriculum*. In turn, *The First Five Years* is informed by European directives on the training of dentists in the European Union.

The GDC has always been guided by the principle that upon successful completion of the undergraduate programme, the graduating dentist is entitled to apply for registration to practise without supervision, within the context of the ethical guidance issued by the GDC. It is a requirement to be registered with the GDC to practise dentistry within the United Kingdom (UK).

Since October 1993, a one-year period of vocational training within an approved general dental practice or in a post within the community dental service has been mandatory for a new UK dental graduate who wishes eventually to be a principal within a National Health Service (NHS) practice. Some graduates undergo a two-year general professional training, which combines the one-year vocational training period with training within a community or hospital setting.

Traditionally most primary dental care was undertaken in general dental practice, either under National Health Service regulations or private contract. The remaining primary care was provided by the Community Dental Service or associated with dental schools. Recently, however, there has been a growing complexity of service delivery in the UK, from often purely NHS or private to a more mixed form of practice. Changes have taken place in the Community Dental Service and other modes of practice such as personal dental services, dental access centres, dental bodies corporate and specialist dental practice.

Secondary care dentistry is provided by NHS consultants and academic staff with honorary consultant contracts, together with their support staff, within dental hospitals and district general hospitals, or by practitioners in specialist dental practice.

There are 13 dental schools in the UK providing undergraduate dental education. Most of the practical clinical training of students takes place within the dental hospitals associated with these schools. Some of the clinical education and training, however, is undertaken in community dental clinics and other primary or secondary care settings including general practice units established by the schools. Other components of the programme take place in the wider university setting, covering subjects in the biological and life sciences, as well as medical, surgical and related subjects. The clinical components of the latter are taught within primary care facilities and acute NHS Trusts. The opportunity to undertake an intercalated honours science degree or PhD provides students with the chance to pursue research and gain valuable experience that will help their future career development.

The dental schools form an integral component of the university but work in close conjunction with NHS hospitals and trusts. Consequently, a dual funding system for dental undergraduate education has developed, partly funded by the National Health Service and partly by one of the higher education funding councils.

As well as regular visitations from the QAA, the GDC visitations to dental schools and final examinations will be arranged on a six-year cycle to ensure that an appropriate educational programme is being provided. These visits assure that the degrees are comparable so graduates from all dental schools meet the requirements of the GDC. Beyond this minimum, dental schools have in place a variety of systems for recognising and encouraging the pursuit of excellence.

The primary dental degree represents the first stage in an educational continuum, which should last throughout a dentist's practising life. As well as vocational training or general professional training, the dentist may further choose to undertake a period of specialist training. The dentist will be also required to undertake a minimum amount of continuing education as a condition of maintaining registration with the GDC. The undergraduate programme should therefore prepare the dentist to undertake lifelong learning throughout professional life. It is within this context that the undergraduate phase of dental education should be placed.

## 1 The nature and extent of programmes in dentistry

1.1 Dentistry is a professional clinical discipline concerned with prevention, detection, management and treatment of oral and dental diseases and maintenance of oral and dental health, in individuals and in society. It is based on sound scientific and technical principles with the clinical aspects of dentistry underpinned by knowledge and understanding of the biological and clinical medical sciences.

1.2 It is essential that all dentists understand the need to act at all times reasonably, responsibly and within the public interest, putting the interests of their patients before those of themselves. Graduates from dental schools are required to demonstrate a thorough understanding of the importance of ethical practice and professionalism, high levels of ability in communication skills and competence in the clinical and technical aspects of dentistry.

1.3 The educational environment should inspire the dental undergraduate to maintain high professional and personal standards and to recognise the importance of lifelong learning in a caring profession. This requires the graduate to appreciate the importance of participation in further formal education and training.

1.4 The educational environment should allow the dental undergraduate to develop an analytical approach to both the theory and practice of clinical dentistry. This will be derived from their education both in the basic and clinical sciences. Required components of student-selected study and project work aim to stimulate critical thought, and allow students to acquire research methods and skills in collection, evaluation and presentation of evidence. This form of educational provision should allow students to develop an adaptable approach to the practice of dentistry so that they can respond effectively to the individual needs of patients and of the communities that they will serve.

1.5 The relationship between dentists and their patients is based on trust. During the undergraduate programme students must be made aware of their responsibilities in relation to confidentiality of information obtained in a professional capacity.

1.6 It is essential that graduating dentists understand the limitations of their current knowledge and clinical abilities. They should be aware of the range of treatments available, and of the current evidence to support their choices, but not be expected to be able to provide them all. In such circumstances they must be able to refer for an opinion on treatment and management by a suitably experienced/qualified individual. They must understand how management regimes may need to take account of patients with special needs.

1.7 Graduating dentists must be aware of the necessity for provision of information to patients on the variety of treatment options that might be available, including the risks involved, so that informed consent can be obtained.

1.8 Graduating dentists must appreciate the need to deliver dental care in a safe environment for both patients and staff in compliance with health and safety regulations. They must be familiar with the principles and practice of infection control and radiation protection, the control of substances hazardous to health and the need to maintain the safety of equipment.

1.9 The delivery of oral and dental care is very much based on a team approach. In addition to dentists, professionals complementary to dentistry (PCDs) are also permitted to undertake certain clinical procedures. It is expected that the dentist should lead that team and accept personal responsibility for decision-making. The dentist should be capable of communicating clearly what treatment should be provided by each of the individual members of the team and must not permit any treatment to be undertaken by any member of the team who does not have the requisite training and experience. To assist in the development of a team approach to oral and dental care, it is helpful to provide joint teaching, where appropriate, to dental students and other members of the dental team.

1.10 It is expected that graduating dentists will have had experience of a wide range of clinical tasks during their undergraduate programme. They will not be highly skilled in all clinical procedures. Flexibility exists within the programme of study to take account of the varying patterns of dental and oral health throughout the UK and according to the patient base of individual dental hospitals.

## 2 Subject knowledge and understanding

Graduates who successfully complete an undergraduate programme in dentistry in the UK should be able to integrate material from all parts of their undergraduate curriculum to demonstrate knowledge and understanding of the following areas and topics:

- 2.1 biomedical sciences which form the basis for understanding human growth, development and health;
- 2.2 integration of human body systems, normal homeostasis and mechanisms of responses to insults including trauma and disease;
- 2.3 oral biology, to include detailed knowledge of the form and function of teeth and associated structures, in health and disease;
- 2.4 modern developments in biomolecular sciences that may impact upon the practice of dentistry;
- 2.5 human diseases and pathogenic processes, including genetic disorders, and the manifestation of those diseases which are particularly relevant to the practice of dentistry;
- 2.6 diseases and disorders of the oral cavity and associated structures, their causes and sequelae together with the principles of their prevention, diagnosis and management;
- 2.7 sources of infection and the means available for infection control;
- 2.8 medical emergencies that may occur in the dental surgery and their prevention and management, including basic life support and resuscitation;
- 2.9 communication between dentist and patients, their families, other health professionals and the public in general;
- 2.10 patients' responses to dental care and an understanding of how these may be affected by experience and psychological, social and cultural influences;
- 2.11 interpersonal skills appropriate for working within a multi-skilled team;
- 2.12 the medico-legal and ethical principles upon which the practice of dentistry is based, especially those relating to treatment of patients and involvement of patients in research;
- 2.13 the principles and importance of health promotion, health education and prevention in relation to dental disease, and how these principles are applied;
- 2.14 the safe and effective management of patients;
- 2.15 specific dental topics including behavioural sciences, biomaterials science, pain and anxiety control, dental public health, oral and maxillo-facial surgery, oral medicine, oral microbiology, oral pathology, oral radiology, orthodontics, paediatric dentistry, pharmacology and therapeutics, preventive dentistry, restorative dentistry;
- 2.16 when, how, and to whom to refer a patient for specialist advice or treatment;
- 2.17 the system for the delivery of health care in the UK with special reference to oral health care;
- 2.18 the oral health needs of different sections of the community, such as those with special needs;
- 2.19 the broad principles of scientific research and evaluation of evidence that are necessary for an evidence-based approach to dentistry;
- 2.20 the importance of clinical audit, peer review and continuing professional education and development.

## 3 Skills and attributes of the graduating dentist

### Key skills

In addition to the subject-specific skills itemised in the following sections, the undergraduate programme in dentistry encourages the development of key transferable skills, which underpin the lifelong educational and training process. Graduating dentists should, therefore, have the ability to:

#### 3.1 Transferable skills

- exercise initiative and personal responsibility;
- communicate effectively at all levels in both the scientific and professional contexts using verbal, non-verbal and written means;

- work effectively as members of a team;
- use information technology as a means of communication, for data collection and analysis, and for self-directed learning;
- analyse and resolve problems, and deal with uncertainty;
- manage time, set priorities and work to prescribed time limits;
- make decisions based on sound ethical, moral and scientific principles;
- manage their learning in the context of establishing a philosophy of continuing professional development;
- acquire, analyse, process and communicate information in a scientific manner to solve problems and to guide clinical decision-making;
- evaluate the evidence published in refereed scientific journals and other publications for sound experimental design and statistical analysis;
- evaluate the validity of claims related to products or techniques.

Professionalism

### 3.2 Professional behaviour and clinical governance

Graduating dentists should be able to:

- understand the role and function of the GDC in regulating the dental profession, and be familiar with its issued guidelines;
- understand the role, function and obligations of the National Health Service;
- manage the ethical issues that may arise in dental practice;
- apply jurisprudence to the practice of dentistry;
- understand the implications of and obtain informed consent;
- understand the ethical and legal basis of confidentiality, including the need to maintain accurate and complete patient records in a confidential manner;
- provide empathetic care for all patients, including members of diverse and vulnerable populations, and respect the principle of patient autonomy;
- provide and receive constructive criticism;
- recognise and take appropriate action to help incompetent, impaired or unethical colleagues and their patients.

### 3.3 Behavioural science and communication

Graduating dentists should base their care of patients on a sound knowledge and experience of the psychological aspects of human behaviour. They should be able to:

- agree dental treatment plans with patients of all ages and, where necessary, through the intermediate consent of a parent, guardian or carer;
- display appropriate behaviour towards all members of the dental team;
- understand the role of psychological development in the management and treatment of the child patient;
- apply the principles of dental anxiety management (behavioural and pharmacological) to the treatment of the anxious dental patient;
- appreciate the importance of psychological and social factors in the delivery and acceptance of dental care by patients;
- recognise the responsibility and demonstrate the ability to share information and professional knowledge verbally and in writing;
- understand the principles of occupational stress and its management.

### 3.4 Becoming a reflective dentist

Graduating dentists should be dedicated to the principle of lifelong learning and continued professional development. They should be able to:

- identify and use sources of continuing professional development and apply critical thought to a continually expanding knowledge base such that professional competence is maintained;
- discharge the obligations incumbent upon every professional person including contributions to, and support for, the profession's collective initiatives in self-regulation, maintenance of standards, and the advancement of knowledge and expertise;
- assess personal progress, including the identification of strengths and weaknesses;
- evaluate all treatment outcomes, including the unexpected, and undertake remedial action where appropriate;
- recognise and fulfil their responsibilities both as adult learners and as teachers;
- use the principles of peer review and quality assurance in dental practice.

Dental health and society

### 3.5 Dental public health

Graduating dentists should understand the health care system in which they will work, and should be able to:

- evaluate social and economic trends and their impact on oral health care;
- recognise their role in and responsibility for improving the general and oral health of the community through treatment strategy, education and service;
- describe and understand the prevalence of oral disease in the UK adult and child populations;

### 3.6 Oral health promotion

- recognise predisposing and aetiological factors that require intervention to promote oral health;
- understand the pattern of oral disease in society and be able to contribute to health promotion;
- assess the need for, and provide, preventive procedures and instruction in oral health methods that incorporate sound biological principles in order to preserve oral hard and soft tissues, and to prevent disease;
- use and provide appropriate therapeutic agents and treatment modalities.

Assessment of the patient and oral environment

This section and the following sections cover the full range of subject-specific skills which relate to the primary care level of clinical dentistry. Graduating dentists should be able to:

### 3.7 Biomedical science

- apply their knowledge and understanding of biomedical sciences, oral biology and biomolecular sciences to the management of their patients;
- recognise the changes that occur with normal growth and ageing and apply their knowledge in the management of the oral environment;
- apply their knowledge of the aetiology and processes of oral diseases in prevention, diagnosis and treatment;

### 3.8 History, examination and diagnosis

- obtain and record a relevant medical history which identifies both the possible effects of oral disease on medical well-being and the medical conditions that affect oral health or dental treatment;
- assess and appraise contemporary information on the significance and effect of drugs and other medicaments, taken by the patient, on dental management;
- obtain a detailed dental history to include chief complaint and history of present illness;



- make a general evaluation of a patient's appearance, including the identification of abnormalities in their physical, emotional or mental status;
- recognise signs of physical, emotional and substance abuse and seek advice from appropriate authorities;
- perform a physical and oral examination to include head and neck, oral hard and soft tissues, vital signs, and recognise disease states and abnormalities including detrimental oral habits;
- establish and maintain accurate patient records;

### 3.9 Oral radiology

- prescribe, take and process appropriate intra-oral and dental panoramic radiographs;
- derive diagnoses by interpreting and relating findings from the history, clinical and radiographic examinations and other diagnostic tests;

### 3.10 Treatment planning

- identify patient expectations and goals for oral care;
- develop, present and discuss prioritised individual treatment options for patients of all ages, including the integrated treatment by PCDs and the need for referral to a specialist;
- explain and discuss the patient's responsibilities and time requirements;
- use their knowledge of the properties of modern dental materials to select and use appropriate materials for treatment;
- manage circumstances where the patient's wishes are considered by the dental team not to be in his/her best interests.

Establishment and maintenance of a healthy oral environment

Graduating dentists should be able to:

### 3.11 Anxiety, pain control and sedation

- recognise the common signs and symptoms of oro-facial pain, anxiety and apprehension;
- assess the level of anxiety in adult and child patients and have experience of using recognised psychological inventories;
- use local analgesia for pain management and recognise and manage potential complications relating to its use;
- assess patients for and inform patients or guardians of the indications, contraindications, limitations, risks and benefits of conscious sedation and general anaesthesia;
- manage fear and anxiety with behavioural techniques and, when appropriate, with conscious sedation techniques;

### 3.12 Dental emergencies

- identify and manage dental emergencies and appropriately refer those that are beyond the scope of management by a primary care dentist;

### 3.13 Dental caries and tooth surface loss - the restoration of teeth

- assess patient risk for dental caries and non-bacterial tooth surface loss and be able to provide dietary counselling and nutritional education for the patient relevant to oral health and disease, based upon knowledge of disease patterns and aetiology;
- restore teeth to form, function and appearance with appropriate materials, using techniques that preserve the health of the pulp and avoid the unnecessary loss of tooth tissues;

### 3.14 Endodontics

- manage diseases and conditions involving the pulpal and periradicular tissues in both primary and permanent teeth;

### 3.15 Prosthodontics

- manage and integrate the procedures necessary to provide biocompatible, functional and aesthetic dental prostheses (fixed and removable) in sympathy with patient requirements or needs;

### 3.16 Occlusion

- apply their knowledge of functional occlusion in health and disease to manage the aetiological factors associated with the disordered occlusion;

### 3.17 Oral medicine, oral pathology and oral surgery

- manage patients with facial pain, disease and disorders of the oral cavity and associated structures, including a recognition of when it is appropriate to refer for specialist help and advice;
- manage basic dento-alveolar surgical procedures, including intra- and post-operative complications and recognise when it is appropriate to refer for specialist help and advice;
- understand the importance of and procedures for submitting specimens for laboratory diagnosis and demonstrate the ability to interpret diagnostic reports;

### 3.18 Orthodontics

- recognise abnormalities of facial growth and development in dental patients and arrange appropriate management of such disorders either within the dental practice or by referral to the relevant specialist;

### 3.19 Paediatric dentistry

- manage the oral health of children and adolescents and perform treatment for them in a manner that incorporates consideration for their expected growth and development, involving parents or guardians as required;

### 3.20 Periodontics

- manage the health and care of the supporting structures of the teeth;

### 3.21 Therapeutics

- recommend and prescribe appropriately pharmaco-therapeutic agents, monitor their effectiveness and safety, and be aware of drug interactions;

### 3.22 Special needs

- recognise their duty of care to manage the oral health of the patient with special needs (including the additional considerations for the dental team) and involve the patient's carer where appropriate;
- manage the dental health care needs of those who may be considered to be socially excluded.

## Working environment

Graduating dentists should:

### 3.23 Health and safety/infection control

- adhere to health and safety legislation as it affects dental practice;
- understand the legal basis of radiographic practice;
- implement and perform satisfactory infection control and prevent physical, chemical or microbiological contamination in the practice of dentistry;
- arrange and use the working practice environment in the most safe and efficient manner for all staff and patients;

### 3.24 Medical conditions and emergencies

- evaluate patients for fitness to undergo routine dental care, modify treatment plans to take account of general medical status, and recognise those patients who are beyond the scope of their management;
- provide basic life support for medical emergencies.

## 4 Teaching, learning and assessment

### Teaching and learning

Teaching and learning in undergraduate programmes in dentistry use a variety of different approaches including:

- lectures;
- tutorials/seminars/workshops;
- practical and laboratory classes;
- group work and problem-oriented learning;
- projects;
- directed self-study;
- the use of communications and information technology;
- the acquisition and development of practical clinical skills;
- observation and treatment of patients;
- reflective practice and integration of learning.

The emphasis on different approaches is dependent upon the philosophy of each individual curriculum, but direct clinical treatment of patients is central to all.

4.1 Traditional lectures provide a means for delivering core information and an introduction to issues, themes or relevant clinical aspects of subjects to be studied. Lectures are used to develop student skills in listening, note taking, understanding and reflection. Such 'formal' presentations can be increased in value by the incorporation of varied presentation techniques, such as encouragement of student participation and planned activity within lectures.

4.2 Tutorials, seminars and workshops are often related to clinical issues or problems and are designed to provide an interactive focus for learning. They are concerned with the development of skills such as communication, teamwork, reasoning and critical appraisal.

4.3 Practical and laboratory classes are an important means of reinforcing deeper understanding of topics as well as developing skills in scientific methodology and in methods of observation relevant to diagnosis and treatment.

4.4 Student engagement in group work or specific educational approaches such as problem-based learning fosters skills such as the location, sifting and organisation of information, time management, task allocation, team working and preparation of reports.

4.5 Dental students need to acquire the facility for directing their own learning. This is an essential attribute of the practising dental surgeon. Directed self-study and the process of undertaking projects independently encourage the development of study skills, self-reliance, independence of thought and the ability to manage time effectively.

4.6 Dental students should acquire transferable skills, including the use of communications and information technology (C&IT) for word-processing, sending electronic mail and accessing information by the world-wide web; working with others in teams; making verbal and written presentations using appropriate audio-visual aids; communication with colleagues and the public. CAL programs can be part of the learning process and a means of delivering and reinforcing IT skills.

4.7 Opportunities must be provided for the identification and acquisition of practical clinical skills. The most common methods adopted are for students to spend time in a clinical skills laboratory or an appropriately equipped clinical area where they rehearse the procedures they will be required to perform on patients.

4.8 Great emphasis is placed on the quality of student management of patients who attend university dental hospitals and outreach facilities for oral health care. The clinical environment can provide an ideal focus for active learning, as each patient presents a unique combination of parameters that affect proposed management. The development of students' oral communication skills and listening skills is of utmost importance in this. The transfer and continued development to clinical reality of practical clinical skills is fundamental to the successful progression of the dental student, as is the acquisition of professional, attitudinal and ethical attributes appropriate to the practice of dentistry.

4.9 An attitude of reflection needs to be fostered so that dental students become increasingly motivated in their search for accuracy of self-assessment. The creation of progress files or reflective logbooks, in which students build a personal portfolio of learning, self-assessment and how they learn, may help. In this respect, integration of knowledge, understanding and skills, acquired from different sources and at different times, will be improved, fostering the first stages of lifelong learning.

#### Assessment

Assessment is recognised as an important factor in the way in which students learn and manage their time. There should be both formative and summative assessments. Summative assessments can be used formatively. The processes of assessment should be transparent: explicit criteria facilitate effective learning and allow for the provision of effective and meaningful feedback. In the development of knowledge, skills and attitudes appropriate to the clinical practice of dentistry, the importance of student progression during the programme must be acknowledged. Whilst, in a global sense, competence is seen to be achieved at the threshold level of graduation, students and teachers must see the value of 'staging posts' along the way.

The attainment of learning outcomes should be demonstrated by clear links with methods of both teaching and learning, with methods of assessment and with the specific tasks of assessment.

4.10 Methods of assessment adopted in dental schools should:

- be relevant to the purposes of undergraduate dental education;
- reflect student progression through the programme;
- encourage integration of knowledge, understanding, skills and attitudes;
- enable students to demonstrate their understanding, level of attainment and to demonstrate a full range of clinical and other abilities;
- provide accurate, constructive feedback to students on their performance;
- indicate whether a student has reached an appropriate standard;
- examine students' communication skills;
- allow records of student academic and clinical performance to be collated;
- allow the participation of external examiners;
- engage in mechanisms of quality assurance;
- provide information for course and programme organisers on the quality of provision;
- reflect the intended learning outcomes of a course.

#### 5 Standards

Upon successful completion of the undergraduate programme of study graduating dentists are eligible to apply for registration with the General Dental Council and then to practise without supervision. Graduating dentists, therefore, will have the professional qualities, attitudes and attributes necessary for this role. As a minimum they will have demonstrated a systematic understanding of the knowledge outlined in the previous parts of this statement. They will be able to apply the key and professional skills gained during the undergraduate programme, being aware of their limited experience, and able to develop new skills to a high level.

#### Professionalism

5.1 Graduating dentists must practise dentistry and conduct their personal lives with professional integrity such as to command the respect and trust of both colleagues and patients, and justify the confidence placed in them through the demonstration of good clinical practice (section 3.3). They should be able to act autonomously in tackling and solving problems and in planning and implementing tasks at a professional level (section 3.3). They should be dedicated to the principle of lifelong learning and continued professional development (section 3.4).

## Knowledge

### 5.2 Graduating dentists will demonstrate:

- systematic understanding of the subject knowledge (sections 2.1-2.20);
- comprehensive understanding of the basis of professional practice;
- practical understanding of the evidence base of clinical practice and the ability to evaluate new information.

## Skills

### 5.3 Graduating dentists will demonstrate:

- key transferable skills including information appraisal and technology (section 3.1);
- initiative and personal responsibility, making decisions based on sound ethical, moral and scientific principles, and applying an independent learning ability;
- the ability to evaluate critically the health care system in which they will work, and to assume responsibility for oral health promotion of individual patients and social groups (sections 3.5-3.6);
- the ability to deal with complex issues in diagnosis and planning treatment, make sound judgements, sometimes using incomplete information, and communicate those decisions to patients and professional colleagues (sections 3.7-3.10);
- competence in, and comprehensive understanding of, the skills outlined in this *statement* (sections 3.11-3.24).

# Appendix 1

## Membership of the benchmark group

Professor Paul Dummer	University of Wales College of Medicine
Professor Ruth Freeman	The Queen's University of Belfast
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