The Joint Committee for Postgraduate Training in Dentistry

The Specialist Advisory Committee in Orthodontics

SPECIALIST TRAINING IN ORTHODONTIC SUBJECTS

CURRICULUM AND SPECIALIST TRAINING PROGRAMME IN

ORTHODONTICS

AIMS, CONTENT, OBJECTIVES AND ASSESSMENT

September 2010

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Abbreviations used throughout the document:

ABSTD	Advisory Board for Specialty Training in Dentistry
ARCP	Annual Review of Competence Progression
BDS	Bachelor of Dental Surgery
BOS	British Orthodontic Society
CCST	Certificate of Completion of Specialist Training
COPDEND	Council of Postgraduate Dental Deans
CPD	Continuing Professional Development
DDS	Doctor of Dental Science
DOH	Department of Health
DOPS	Direct Observation of Procedural Skills
DPCO	Diploma in Primary Care Orthodontics
DwSI	Dentist with Special Interest
FDS	Fellowship of Dental Surgery
FTTA	Fixed Term Training Appointment (from July 2010 these are known as Post-CCST training posts)
GDC	General Dental Council
GPT	General Professional Training
ICT	Information and Communication Technology
ISFE	Intercollegiate Specialty Fellowship Examination
JCPTD	Joint Committee for Postgraduate Training in Dentistry
JCSTD	Joint Committee for Specialist Training in Dentistry
MCQ	Multiple Choice Questions
MiniCEX	Short Clinical Examination Exercise
MFDS	Membership of the Faculty of Dental Surgery
MJDF	Membership of the Joint Dental Faculties
MOrth	Membership in Orthodontics

MSA	Multiple Short Answers
MSF	Multi-source Feedback
NTN	National Training Number
OSCE	Objective Structured Clinical Examination
PCT	Primary Care Trust
RCS	Royal College(s) of Surgeons
RITA	Record of In-Training Assessment
SAC	Specialty Advisory Committee
SCR	Structured Clinical Reasoning Test
SDEB	Specialist Dental Education Board
TPD	Training Programme Director

This document has been prepared with due regard to the changing circumstances at the time of publication. The Specialist Advisory Committee (SAC) in Orthodontics endeavours to maintain its policy documents as current as possible at the time of preparation. The SAC in Orthodontics takes no responsibility for matters arising from changed circumstances or information or material which may have become available subsequent to the publication of this document.

Introduction and Background

The planning of this curriculum document for training in orthodontic subjects began in 1994 when it became necessary for the development of a national plan for structured training following the Calman Report and the first Chief Dental Officer's Report.

In November 1995 the Curriculum Working Party of the SAC produced a curriculum together with Aims, Objectives, Content, Learning Outcomes and Assessments leading to the Membership examinations of the Royal Colleges (MOrth RCS) for all trainees in orthodontics. The curriculum was set out, in accordance with modern educational practice, in a modular format to assist teaching and assessment. In response to a request from the Specialist Dental Education Board of the General Dental Council in 2008, a new version has been produced to reflect the need for an outcome based curriculum which is indicative of the competencies required at the varying levels of training within the specialty together with the knowledge, skills and attitudes achieved by the trainee in acquiring those competencies. The extensive revision of the curriculum has been based on current thinking and the requirements for:

- Greater protection of the public by providing clear information as to the level of training achieved
- Improved access to specialist training by general practitioners
- Greater flexibility to training through the availability of both full and part-time training pathways
- Giving appropriate recognition for accredited prior learning
- Producing a competent workforce with the appropriate skills and knowledge necessary to meet the varying levels of treatment complexity, as well as considering the relative need and demand of potential patients.

1. Rationale

1.1 Purpose of the Curriculum

In developing the curriculum, the SAC have been mindful of the requirements to both protect the public and to train a competent workforce with the appropriate skills and knowledge necessary to meet the varying levels of treatment complexity, as well as considering the relative need and demand of potential patients.

The majority of patients in the current population of the United Kingdom have a treatment complexity that can be managed by a Specialist Orthodontist. The purpose of the 3 year curriculum is to enable trainees (StRs) in Orthodontics to achieve the level of competence expected in order to provide appropriate care for this group of patients normally treated in the primary care setting.

It is essential that the public have a clear understanding as to the level of training undertaken by an orthodontic practitioner and that the 'specialist' has the appropriate knowledge and skills to provide care for the needs of a specific patient group.

This curriculum is not intended to provide competence in the management of patients requiring more complex multidisciplinary medical and/or other dental specialty care. It is expected that 'specialists' providing such care would currently undertake an extended, additional period of training that equips them to deliver more complex maxillo-facial orthodontic treatments and associated services[1]. Both the

Specialist Dental Education Board and the GDC Education Committee appreciate the importance of a different, and more appropriate, quality assured training for those who wish to be competent in the management of these multidisciplinary patients. This will be considered further as part of the GDC's Specialist List Review scheduled for 2011.

The requirement to train a separate specialist workforce with the different, yet appropriate, knowledge, skills and attitudes to manage this specific group of highly complex patients supports the agreed 18 week Commissioning Pathway[2], which has been accepted by both the DoH and the British Orthodontic Society. The details of how the training to manage these separate groups of patients compares can be seen at Appendix 1 and also at the following link: http://www.rcseng.ac.uk/fds/jcptd/higher-specialist-training/higher-specialist-training-docs

The programmes include all the features of the European Erasmus training programme[3] and fulfil the requirements of the directives of the Commission of the European Communities on Dental Education regarding the education of orthodontists[4], the Advisory Committee on the training of Dental Practitioners[5] and the World Federation of Orthodontists guidelines for postgraduate orthodontic education[6].

The training programmes are founded on a training centre, normally comprising a university dental school and dental hospital together with other associated, recognised and validated training environments.

Completion of the 3 year specialist training programme is marked by the successful completion of one of the Membership examinations of the Royal Surgical Colleges (MOrth RCS). It is anticipated that a Tricollegiate Membership examination will be developed in the near future.

All trainees on CCST training programmes will be required to achieve the same standards of competence and will hold National Training Numbers (NTNs) to enable monitoring of their training by the Postgraduate Deaneries in conjunction with the SAC. This is as defined in the Memorandum of Understanding between the GDC and members of the JCSTD (2008)[7].

The 3 year full time programme (or its part time equivalent) will lead to a CCST in Orthodontics, subject to the satisfactory completion of the in-training assessments.

1.2 Curriculum development

The curriculum has been written, developed and modified by a working group of the SAC in Orthodontics; Professor Nigel Hunt (Chair), Professor Fraser McDonald (RCS England), Professor Jonathan Sandy (RCS Edinburgh) and Mr Jonathan Sandler (Consultant Group of BOS), in conjunction with the Lead Postgraduate Dean for Orthodontics (Mrs Elizabeth Jones). The curricula have subsequently been discussed and approved by the full SAC in Orthodontics which, in addition to the above, includes representatives from the Royal Colleges and the constituent groups of the British Orthodontic Society; Mr Stephen Rudge (Consultant Group), Mr Ivan Connolly (RCPS Glasgow), Dr Friedy Luther (University Teachers Group), Mr Chris Lowe (Orthodontic Specialists Group), Mr Mike Smith (Orthodontic Community Group) and Ms Sophia Wahla and Ms Sally Walker (Training Grades Group). The curricula have also been modified in the light of comments from a lay representative, Mr Robert Posner (Positive Communications).

The structure and curriculum has been presented to, and approved by, the Executive of the British Orthodontic Society (BOS), the Education Committee of the BOS as well as the Chairs of the BOS constituent groups, including the Training Grades Group. The curriculum has also been approved by the Education Committee of the GDC, the JCSTD/ JCPTD and the SDEB.

1.3 Context of training

Training and education should be systematically planned in both the clinical and academic environments. The educational contract should be structured and, in this context, training should take precedence over

service provision. Few hospitals and clinics can provide complete training and hospital departments are normally expected to link with University Dental Schools, primary care settings and other training environments to provide all aspects of teaching and training as appropriate. Educational plans should be co-ordinated so that the opportunities available in approved training environments can be linked to form an orthodontic training network. Training has been planned in modules linked to various generic and specialty specific topics.

In preparation for specialists undertaking and maintaining a modern evidence-based approach to orthodontic practise, achieved through continuing professional and personal development, it is expected that trainees have personal research training and experience. This experience is expected for all trainees and should be structured to the eventual career intentions of the trainee. The research component should fulfil the minimum M level requirements of the Quality Assurance Agency and may take the form of the satisfactory submission of a research dissertation (for example as part of an MSc, MClinDent, DDS or equivalent), and/or two papers in appropriately peer reviewed journals submitted on work undertaken during the training period. Academic trainees would normally be expected to spend time acquiring a PhD or other higher research qualification.

Trainees must be informed of assessment processes and the part played by Training Programme Directors, Postgraduate Deaneries, and the SAC in Orthodontics, the ABSTD, the JCPTD and the General Dental Council. Trainees should take part in local, regional and national educational events.

1.4 Entry Criteria

Fully registered dental graduates may apply for the specialty training programmes usually following, at least, 2 years foundation training or its equivalent, in a practice or hospital environment either within the UK or the European Union.

Entry is competitive and the possession of the MJDF/MFDS/FDS of the Royal Colleges (or their equivalent), whilst not essential, may be used as a marker of the completion of the foundation period. Similarly, candidates may consider it desirable to be in possession of the Part 1 MOrth examination, which covers applied science in relation to orthodontic practice, prior to commencing specialist training. This paper based examination can be taken at any time following basic dental qualification and is available to candidates from any country. An on-line version is currently being developed. Those candidates who have passed the Part 1 MOrth examination would gain exemption from the relevant academic modules of the curriculum (see Appendix 1). The selection panels will also be looking for evidence of motivation, commitment to the specialty, a logical career progression and continuing professional development.

A more flexible approach to entry to specialty training is being encouraged. Applicants who have successfully completed an approved training programme leading to the Diploma in Primary Care Orthodontics (DPCO) of the Faculty of General Dental Practice (UK) will be given appropriate exemption from those parts of the academic modules covered in the specialist training programmes as part of their academic accredited prior learning (see Appendix 1). It should be noted that in view of the longitudinal nature of orthodontic care, the clinical component of such ‘top-up’ training will still be undertaken over a minimum three year period.

All training posts in orthodontics should be advertised in the *British Dental Journal* in the first instance. Other advertisements, coordinated through the respective Deanery, may be undertaken depending upon local recruitment needs.

1.5. Duration of training

The training programme leading to the CCST in Orthodontics will be not less than 3 continuous years of full-time training or the equivalent part-time training (maximum time in training 6 years).

Locum experience would not normally be accepted as part of the 3 year programme.

1.5.1. Breaks in training

The longitudinal nature of orthodontic treatment provision means that an interruption in training may have a deleterious effect on the trainee's knowledge and clinical skills acquisition. When there has been an absence from training in excess of three months, the Postgraduate Deanery must be notified and they, in conjunction with the SAC in Orthodontics, will determine a revision of the training period and the clinical programme that the trainee will be expected to complete on resumption of training.

1.5.2. Individual Needs: Flexible and Part-time Training

Flexible (Less than full time) Training over a more extended period for those with non-professional commitments or health issues can be arranged. Flexible trainees must complete the curriculum within a *pro-rata* training experience. Full-time trainees can apply through the Postgraduate Deaneries to become flexible trainees and flexible trainees can apply to revert to full-time training by arrangement and with the approval of the Postgraduate Dental Dean and the TPD. The interruptions in training noted above apply to all trainees irrespective of whether they are full-time, part-time or on a flexible programme.

Part-time programmes will be similar to flexible training schemes, and involve competitive entry. For those opting for a part-time training, the trainee must be flexible in the sessions worked per week over the training period in order to attend those aspects of additional teaching and training required to complete the appropriate curriculum.

The total length of flexible and part-time training should not be less than that of full-time training. Flexible and part-time programmes would normally be for a minimum of six sessions per week.

2. Content of Learning

2.1 Aims of Training

The trainee should acquire the appropriate knowledge, attitudes and skills of a Specialist Orthodontist. Trainees should possess a sense of professionalism, interest and enquiry. These characteristics should encourage the specialist to maintain competency throughout their career by the continuous pursuit of Continuing Professional Development.

2.2 Objectives of the 3 year programme

On completion of training the graduate will demonstrate the following aptitudes:

Generic Specialist Skills

- A professional and ethical approach to patient care.
- A professional attitude to all members of the dental team.
- A scientific attitude, an inquiring mind and the stimulation of professional curiosity.
- A thorough understanding of scientific methodology.
- An ability to interpret the relevant literature.
- An awareness of current legislation and working practices relating to the practice of dentistry.
- An ability to develop themselves by both reflective practice and self evaluation.

- An ability to teach (this includes all members of the dental team).
- An ability to promote and apply dental health education.

Orthodontic Specific Specialist Skills

- Diagnose anomalies of the dentition.
- Detect deviations in the development of the dentition, of facial growth and the possession of functional abnormalities.
- Evaluate the need for orthodontic treatment.
- Formulate a treatment plan and predict its course.
- Carry out interceptive orthodontic measures.
- Execute simple and complex treatment procedures.
- Evaluate orthodontic progress and treatment outcomes.
- Possess an overview of the multidisciplinary approach for the treatment of dentally and medically compromised patients.
- Be able to acquire and interpret research information and data.
- Be able to prepare oral and written clinical and research findings.

2.3 Section A - Generic Knowledge, Skills and Attitudes

Module 1 - Cell and Molecular Biology with Genetics
Module 2 - Embryology, growth and development of the face and jaws
Module 3 - Psychology
Module 4 - Research with ICT
Module 5 - Radiological Imaging Techniques
Module 6 - Oral Health
Module 7 - Dental Health Education
Module 8 - Health and Safety
Module 9 - Clinical Governance

2.4 Section B – Orthodontic Specialist Specific Knowledge, Skills and Attitudes

Module 10 - Normal and Abnormal Development of the Dentition
Module 11 - Temporomandibular Dysfunction and Orthodontics
Module 12 - Tooth Movement and Facial Orthopaedics
Module 13 - Orthodontic Materials and Biomechanics
Module 14 - Aetiology of Malocclusion
Module 15 - Airway, Craniofacial Development and Malocclusion
Module 16 - Diagnostic Procedures
Module 17 - Treatment Planning
Module 18 - Growth, Treatment Analysis and Cephalometry
Module 19 - Long-term Effects of Orthodontic Treatment
Module 20 - The Iatrogenic Effects of Orthodontic Treatment
Module 21 - Epidemiology in Orthodontics
Module 22 - Orthodontic Literature and Research
Module 23 - Removable Appliances
Module 24 - Functional Appliances
Module 25 - Extra-Oral Appliances
Module 26 - Fixed Appliances
Module 27 - Retention Appliances
Module 28 - Guiding the Development of the Occlusion
Module 29 - Adult Orthodontics

Module 30 - Orthodontics and Minor Oral Surgery
Module 31 - Orthodontics and Restorative Dentistry
Module 32 - Overview of Multidisciplinary Management of Facial Disharmony
Module 33 – Management
Module 34 – Teaching and communication

SECTION A - GENERIC KNOWLEDGE, SKILLS AND ATTITUDES

MODULE 1-
Cell and Molecular Biology

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information regarding: • Cells and molecules as they relate to the development and growth of the craniofacial complex, and their relevance to the assessment and treatment of patients	• Describe bone formation and remodelling in health and disease • Describe both normal and abnormal development of teeth and surrounding structures	• Apply knowledge of craniofacial biology to the assessment and treatment of patients	• Recognize the importance of cell biology for normal and abnormal craniofacial development	• Attend trainee seminars within department • Web based e-learning sources • Independent study • Attendance at suitable course • Attendance at suitable meetings	• Written examination • Structured Clinical Reasoning (SCR) • Workplace based assessment

MODULE 2 - Embryology, growth and development of the face and jaws

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information regarding: • Growth and development of structures of the head and neck, and their relevance to the assessment and treatment of patients	• Describe normal and abnormal facial development including common malformations	• Apply knowledge of facial embryology, growth and development to the assessment and treatment of patients	• Recognize importance of developmental biology for normal and abnormal facial formation • Recognize the importance of patterns of facial growth in relation to patient assessment and treatment	• Attend trainee lectures / seminars within the department • Independent study • Attendance at suitable course • Attendance at suitable meetings • Web based e-learning sources	• Written examination and/or viva (Structured Clinical Reasoning) • Objective Structured Clinical Examination (OSCE) • Workplace based assessment

MODULE 3 - Psychology

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information about and experience in: • The psychological basis of patients at assessment, during orthodontic treatment planning and delivery and subsequent to treatment	• Describe normal psychological development from childhood to adulthood • Describer normal and abnormal psychological development including disorders of personality	• Apply knowledge of psychological development to the assessment and orthodontic treatment of patients	• Recognize the importance and applies knowledge of psychology for normal and abnormal patient profiles	• Attend trainee seminars within the department • Independent study • Attendance at suitable course • Attendance at suitable meetings • Web based e-learning sources	• Written examination and/or viva (Structured Clinical Reasoning) • OSCE

MODULE 4 -
Research with Information and Communication Technology (ICT)

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information about and experience in: • Current technology to support data acquisition and research	• Describe the operation of information and communication technology • Identify and use search engines and protocols • Discriminate evidence-based websites	• Apply knowledge of information and communication technology to the delivery of care to patients	• Recognize importance of appropriate interpretation of research to support delivery of care to patients	• Attend trainee seminars within the department • Independent study with ICT and web based e-learning sources • Attendance at suitable course • Attendance at Suitable meetings	• Workplace based assessment • Written paper (including MCQ / MSAs) • On-line assessment and viva

MODULE 5 - Radiological Imaging Techniques

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information about and experience in: • Principles and practice of imaging and the relevant imaging technology	• Explain the operation of contemporaneous imaging equipment within legislation • Describe radiation protection and ALARA guidelines	• Apply knowledge of imaging techniques to the diagnosis and management of orthodontic patients	• Recognize the importance and appropriate use of imaging for the benefit of the patient • Exhibit an awareness of the legal basis of protecting the patient and staff	• Attend trainee seminars / tutorials • Attendance at suitable course • Independent study • Web based e-learning sources	• On-line, written assessment • Case presentations • OSCE • SCR

MODULE 6 - Oral Health

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information about and experience in: • The importance of oral health principles and practice	• Identify oral health issues in patients receiving specialist care • Describe indices of treatment need and complexity	• Apply knowledge of oral health strategies to diagnosis and management of patients	• Recognize the importance of oral health care in the management of patients • Recognize the need to inform patients of the relevant risks and benefits of treatment	• Attend trainee seminars within department • Independent study • Attendance at suitable course • Attendance at suitable meetings	• Workplace based assessment • DOPS • On-line, written assessment and viva • Communication station in OSCE

MODULE 7 -
Dental Health Education

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information about and experience in: • Principles and practice of patient education in oral and dental health	• Outline methodologies for the motivation of patients undergoing specialist care	• Apply knowledge of patient education	• Recognize importance of the need for the appropriate level of patient education	• Attend trainee seminars within department • Independent study • Web based e-learning sources • Attendance at suitable course	• On-line, written assessment and viva • Communication station of OSCE • DOPS

MODULE 8 - Health and Safety

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information about and experience in: • Principles and practice of Health and Safety with respect to specialist care	• State the requirements and legislation of Health and Safety as it applies to protection of staff and patient care	• Apply knowledge of Health and Safety to the diagnosis and management of patients • Apply knowledge of Health and Safety to the protection of staff	• Recognize importance of patient safety • Recognize the importance of staff safety	• Attendance at suitable course. • Attendance at suitable meetings • Use of appropriate websites	• Workplace based assessment • On-line, written assessment and viva

MODULE 9-
Clinical Governance

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information about and experience in: • Principles and practise of clinical practice in a specialist environment	• Describe the underlying principles of clinical governance and the ways in which the principles can be applied to the delivery of specialist dental care	• Apply knowledge of clinical governance within a specialist environment	• Recognize the importance of clinical governance to the quality of patient care and safety in all specialist care settings	• On line module • Workplace based assessment of participation in audit	• On-line, written assessment • DOPS

SECTION B -
ORTHODONTIC SPECIALIST SKILLS, KNOWLEDGE AND ATTITUDES

MODULE 10 -
Normal and abnormal development of the dentition

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information about and experience in: • The development of normal occlusion from birth to adulthood • The effect of genetic and environmental influences on the development of the dentition • The development of malocclusion, including its variations and ranges of severity	• Describe both normal and abnormal dental development • Identify the developmental stage of the dentition • Describe factors responsible for developmental abnormalities	• Demonstrate an assessment of the dentition, craniofacial skeleton and soft tissues • Perform the taking, analysis and interpretation of the current imaging techniques utilised in orthodontic practice • Communicate the development process of the dentition to the patient/parent • Discuss the possibilities for interceptive measures to improve any current or developing abnormal situation	• Recognize the importance of basic head and neck biology for an understanding of the delivery of orthodontic health care • Recognize the use of appropriate scientific terminology in the explanation of dental / developmental problems and treatment to patients /parents	• Attend trainee seminars/ lectures/ tutorials • Independent study • Web based e-learning sources • Attendance at suitable course • Attendance at suitable meetings	• Workplace based assessment • Written examination and/or viva (SCR) • OSCE

MODULE 11 –
Temporomandibular dysfunction and orthodontics

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information about and experience in: • The importance of TMD to orthodontists • Anatomy and physiology of the TMJ • Diagnosing and monitoring the presence of TMD and its progress if present • The aetiology of TMD • The management of TMD	• Describe normal TMJ function and variations thereof • Diagnose and treatment plan with respect to TMD • Outline the interaction of TMD in orthodontic patients	• Perform the taking, interpretiion and analysis of history, clinical findings and image analysis of TMD patients • Practise the assessment of TMD in orthodontic patients • Communicate advice to patients who are at risk/identified with TMD	• Recognize the importance of sound diagnostic skills in identifying TMD	• Attend trainee seminars / tutorials • Independent study • Web based e-learning sources • Attendance at clinics • Attendance at suitable course • Attendance at suitable meetings .	• Workplace based assessment • Written exam and/or viva (SCR) • OSCE • MiniCEX

MODULE 12 –
Tooth movement and facial orthopaedics

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information about and experience in: • Exfoliation and eruption of the dentition • Biology of tooth movement • Resorption of dental structures	• Describe normal exfoliation and eruption of teeth • Describe the histology of tooth movement • Describe the resorption of dental structures	• Apply histology and biochemical knowledge to normal loss of teeth, eruption and growth of teeth	• Recognize the importance of such processes during orthodontic tooth movement • Recognize the need for the explanation of treatment options including the risks of treatment	• Attend trainee lectures / seminars / tutorials • Independent study • Web based e-learning sources • Attendance at suitable course • Attendance at suitable meetings	• Workplace based assessment • Written exam and/or viva (SCR) • OSCE • MiniCEX

MODULE 13 –
Orthodontic materials and biomechanics

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information about and experience in: • The types of materials available and their properties • The interaction of orthodontic brackets and wires and the tooth movements achieved	• Describe the range of materials used in orthodontics • Explain archwire sequences and their justification • Describe the way in which archwires achieve their tooth movements • Outline variations of biomechanics	• Select appropriate materials required for the clinical situation • Explain to patients/ parents the advantages/ disadvantages and use/limitations of different material options • Apply appropriate materials to achieve specific tooth movements and the way to achieve these • Analyse and accounts for desired and undesired tooth movements	• Recognize the importance of normal archwire sequences • Recognize the appropriate pace of treatment progress • Recognize the need for the explanation of treatment progress • Recognize the importance of iatrogenic effects of orthodontics	• Attend trainee seminars / lectures / tutorials • Practical typodont courses • Independent study • Web based e-learning sources • Clinical treatment of patients • Attendance at suitable courses • Attendance at suitable meetings	• Workplace based assessments • Written exam and/or viva (SCR) • OSCE • Clinical exam (presentation of treated cases) • DOPS

MODULE 14 – Aetiology of malocclusion

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessments
This module is intended to provide information about and experience in: • Skeletal factor aetiology • Soft tissue factor aetiology • Local/dental factor aetiology	• Identify specific causes of malocclusion • Outline genetic influences • Describe environmental influences	• Analyse and interprets clinical findings with respect to the diagnosis of the malocclusion • Design suitable treatment plans taking into consideration the cause of the malocclusion	• Recognize the importance of aetiology with respect to the development of the malocclusion • Recognize the role of aetiology in the formulation of the treatment plan	• Attend trainee lectures / seminars • Independent study • Web based e-learning sources • Attendance at suitable courses • Attendance at suitable clinics and provision of patient treatment	• Workplace based assessments • Written exam and/or viva (SCR) • OSCE • DOPS

MODULE 15 –
Airway, craniofacial development and malocclusion

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessments
This module is intended to provide information about and experience in: • The importance of respiratory patterns in orthodontics and the desirability of nasal breathing • The relationship between airway patency, craniofacial development and malocclusion	• Describe normal respiration • Describe the relationship between respiration and malocclusion	• Clinically evaluate respiration, and interprets signs and results of special tests • Extrapolate findings to the influence this may have on malocclusion	• Recognize the importance of normal respiration	• Attend trainee seminars and lectures • Independent study • Web based e-learning sources • Attendance at suitable courses • Attendance at suitable meetings • Attend suitable diagnostic clinics	• Workplace based assessments • Written exam and/or viva (SCR) • OSCE

MODULE 16 – Diagnostic procedures

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information about and experience in: • Clinical assessment • Radiographic assessment • Study model analysis • Other special tests	• Describe the clinical assessment and diagnosis of malocclusion	• Collect, interpret and analyses clinical records pertinent to clinical diagnosis	• Recognize the importance of systematic and thorough diagnosis • Recognize the need for the explanation of patient malocclusion	• Clinical demonstrations • Attend trainee seminars • Independent study • Web based e-learning sources • Attendance at suitable courses • Attendance at suitable clinics and provision of patient treatment	• Workplace based assessments • Written exam and/or viva (SCR) • OSCE • DOPS

MODULE 17 – Treatment planning

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information about and experience in: • Identification of patient concerns • Identification of treatment aims • Identification of the type of treatment necessary to achieve those aims	• Identify patients' expectations • Explain information to patients relevant to the delivery of treatment • Describe the way in which the treatment delivers the objectives	• Evaluate information required for treatment planning • Evaluate all possible treatment options including the provision of no treatment	• Recognize the importance of whether or not malocclusion can be corrected successfully • Recognize the need for considering the patient factors that may modify treatment	• Attend trainee case seminars / case conferences • Independent study • Attendance at suitable courses • Attendance at suitable clinics and provision of patient treatment • Attendance at suitable meetings	• Workplace based assessment • Written examination (SCR) • OSCE • MiniCEX • DOPS

MODULE 18 –
Growth, treatment analysis and cephalometry

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessments
This module is intended to provide information about and experience in: • Basic cephalometric analysis • Superimposition techniques for lateral skull radiographs • Growth analysis based on serial lateral skull radiographs • Use of cephalometric templates • Evaluation of treatment changes: other methods • Estimation of growth status	• Describe the use of superimposition techniques • Explain growth and the influence of treatment on growth and *vice versa* • Identify the difficulties of predicting growth	• Interpret superimposition of growth measurements with time • Evaluate the accuracy of superimposition techniques	• Recognize the importance of growth analysis • Recognize the need for the explanation of treatment progress	• Attend practical demonstrations • Attend trainee seminars / tutorials • Independent study • Web based e-learning sources • Attendance at suitable course .	• Workplace based assessment • Written examination (SCR) • OSCE • MiniCEX • DOPS

MODULE 19 –
Long-term effects of orthodontic treatment

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information about and experience in: • Presentation and nature of relapse • Aetiology of relapse • Contemporary retention regimens • Adjunctive techniques to reduce relapse	• Describe treatment and its effect on stability • Identify malocclusion type and its relation to potential relapse • Outline current research and controversies in retention	• Demonstrate the identification of an orthodontic regimen supported by data • Perform the provision of retention appropriate to the initial malocclusion	• Recognize the importance of post treatment change • Recognize the need to explain retention as part of informed consent	• Attend trainee seminars • Independent study • Web based e-learning sources • Attendance at suitable course • Attendance at suitable clinics and provision of patient treatment • Attendance at suitable meetings • Attendance at journal clubs	• Written examination (SCR) • OSCE • DOPS • Presentation of treated cases

MODULE 20 –
The iatrogenic effects of orthodontic treatment

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessments
This module is intended to provide information of the risks relevant to the assessment and treatment of patients and includes: • Root resorption • Effects on the enamel • Effects on the periodontium • Effects on the pulp • Adverse effects on dentofacial appearance • Adverse effects on the soft tissues including headgear injuries and allergic reactions • Influences on the temporo-mandibular joints	• Describe the risk factors in causing iatrogenic damage • Describe the clinical diagnosis of iatrogenic effects • Justify the clinical protocols for minimising and treating the damage when identified	• Communicate the risks of orthodontic treatment to a patient • Manage orthodontic appliances to minimise iatrogenic affects	• Recognize the importance of detailing risks in informed consent • Recognize the need for balance of the explanation of risks/benefits of treatment	• Attend trainee seminars / tutorials • Independent study • Web based e-learning sources • Attendance at suitable courses • Attendance at suitable meetings	• Written examination (SCR) • OSCE • DOPS

MODULE 21 – Epidemiology in orthodontics

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information about and experience in the influences on orthodontic care of: • Gender • Peer pressure • Ethnic group • Social class • Confidence in treatment • Self-esteem • Aesthetics • Clinical treatment need	• Identify ethnic, gender and social influences on orthodontic treatment provision • Describe peer pressure and self esteem assessments • Explain the need and demand for orthodontic care	• Evaluate the patients needs and background • Demonstrate the incorporation of these influences in treatment planning	• Recognize the importance of psychosocial factors in orthodontic care	• Attend trainee lectures /seminars • Independent study • Attendance at suitable courses • Attendance at suitable meetings	• Written examination (SCR) • OSCE

MODULE 22 –
Orthodontic literature and Research

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessments
This module is intended to provide information about and experience in: • Methods of critically analysing the literature • Summarising an article or literature • Undertaking a research project leading to publication	• State how to read the literature and synthesise the information provided • Describe how to interpret data • Describe how to apply data interpretation to clinical practice	• Apply methodology to undertake a systematic style review • Write a scientific abstract • Report data in an article or dissertation	• Recognize the importance of new data developments • Recognize the importance of evidence based clinical care treatment	• Attend trainee seminars including statistics seminars • Independent study • Web based e-learning sources • Attendance at suitable courses • Attendance at suitable meetings • Attendance at journal clubs	• ARCP research milestones • Submission of a dissertation and /or articles for publication

MODULE 23 – Removable appliances

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessments
This module is intended to provide information about and experience in: • The components and design of removable appliances • Advantages and disadvantages of removable appliances	• Explain the mode of action of removable appliances • Justify materials used to construct removable appliances • Describe how these components are combined to design an effective appliance	• Perform the fitting and activation of appliances • Demonstrate the management of patients at first and subsequent follow up appointments	• Recognize the importance of sound removable appliance design and management in contemporary orthodontics	• Attend trainee seminars /lectures /tutorials • Independent study • Web based e-learning sources • Attendance at suitable courses • Attendance at suitable meetings • Attendance at suitable clinics and provision of patient treatment	• Workplace based assessments • Written exam and /or viva (SCR) • OSCE • DOPS

MODULE 24 – Functional appliances

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessments
This module is intended to provide information about and experience in: • The scope and limitations of functional appliances	• Describe the indications and contraindications for the use of functional appliances • Describe the design and construction of various types of functional appliance • Explain the relative merits of different appliance designs	• Apply knowledge of the integration of functional with fixed appliances • Design growth modification appliances appropriate for specific malocclusions	• Recognize the importance of the timing of treatment with functional appliances • Recognize the tooth movements achieved with functional appliances	• Attend trainee seminars/ lectures /tutorials • Independent study • Web based e-learning sources • Attendance at suitable courses • Attendance at suitable meetings • Attendance at suitable clinics and provision of patient treatment	• Workplace based assessments • Written exam and /or viva (SCR) • OSCE • DOPS • Presentation of treated cases

MODULE 25 – Extra-oral appliances

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessments
This module is intended to provide information about and experience in: • The use of extra-oral anchorage and traction • The timing of treatment with extra-oral forces • Retraction and protraction headgears • Force levels and direction/ duration of force	• Explain the Indications and contraindications for the use of extra-oral forces • Identify headgear safety • Describe directional forces used in extra-oral traction. The use of cervical, horizontal and high pull headgear and protraction headgear	• Apply the design, construction and management of appliances to deliver extra-oral forces • Apply extra-oral forces to fixed, functional and removable appliances • Interpret the literature with regard to treatment / management of patients with headgear	• Recognize the risks of treatment with extra-oral forces and procedures to limit those risks. The medico-legal implications of headgear treatment • Recognize the need for the explanation of treatment options including the risks of treatment	• Attend trainee seminars / tutorials /lectures • Attend clinical demonstrations • Independent study • Attendance at suitable courses • Attendance at suitable clinics and provision of patient treatment	• Workplace based assessments • Written exam and /or viva (SCR) • OSCE • DOPS • Presentation of treated cases

MODULE 26 – Fixed appliances

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessments
This module is intended to provide information about and experience in: • The scope and limitations of fixed orthodontic appliances • Indications and contraindications for their use • The placement, bonding and cementation of fixed orthodontic appliances • Anchorage planning and control in fixed orthodontic appliance therapy • The use of ligatures and elastics	• State the design, manufacture and construction of fixed orthodontic appliances • Describe the various types of fixed orthodontic appliances • Describe the types of pre-adjusted edgewise appliances and prescriptions • Outline other appliance systems including Tip-Edge and self-ligating bracket systems • Describe intra-oral auxiliaries, temporary anchorage devices and expansion appliances	• Select, fits and manages fixed appliance systems appropriate to the treatment of specific malocclusions • Interpret the literature with regard to bracket system choice	• Recognize the appropriateness of fixed appliances for the treatment of specific malocclusions	• Attend typodont courses • Attend trainee seminars / tutorials • Independent study • Attendance at suitable courses • Attendance at suitable meetings • Attendance at suitable clinics and provision of patient treatment	• Workplace based assessments • Written exam and /or viva (SCR) • OSCE • DOPS • Presentation of treated cases

MODULE 27 – Retention appliances

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessments
This module is intended to provide information about and experience in: • The design and use of retention appliances • The duration of post treatment retention in the light of available knowledge	• Describe post-retention changes after active tooth movement • Describe post-treatment orthodontic retention	• Design, fit and monitor appropriate retention appliances following active orthodontic treatment • Interpret the literature with regard to retention appliance choice and regime	• Recognize the need for post treatment retention • Recognize the importance of explaining the need for post-treatment retention as part of a comprehensive treatment	• Attend trainee seminars • Independent study • Web based e-learning sources • Attendance at suitable courses • Attendance at suitable meetings • Attendance at suitable clinics and provision of patient treatment	• Workplace based assessments • Written exam and /or viva (SCR) • OSCE • DOPS • Presentation of treated cases

MODULE 28 –
Guiding the development of the occlusion

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information about and experience in: • Interceptive Orthodontics • Elimination of local factors • Treatment of crossbites • Early correction of skeletal discrepancies	• Describe the consequences of early loss and prolonged retention of teeth • Recall the evidence for and against early intervention • Diagnose and distinguish normal facial growth from abnormal growth	• Interpret clinical findings to identify normal and abnormal development • Design treatment plans for early intervention for abnormal development	• Recognize the need and limitations of early intervention • Recognize the need to limit early intervention	• Attend trainee seminars / lectures / tutorials • Independent study • Web based e-learning sources • Attendance at suitable courses • Attendance at suitable meetings • Attendance at suitable clinics and provision of treatment	• Workplace based assessments • Written exam and /or viva (SCR) • OSCE • MiniCEX

MODULE 29 – Adult orthodontics

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information about and experience in: • Periodontal considerations • Temporomandibular joint considerations • Comprehensive vs compromise treatments • Appliance therapy - special considerations	• Identify dental health considerations in adult patients • Describe adjunctive therapy: its goals, principles and procedures	• Motivate adults and manages their expectations of orthodontic intervention	• Recognize the limitations of adult orthodontic treatment	• Attend trainee seminars / tutorials • Independent study • Attendance at suitable courses • Attendance at suitable meetings • Attendance at suitable clinics	• Workplace based assessments • Written exam and /or viva (SCR) • OSCE • MiniCEX

MODULE 30 –
Orthodontics and Minor Oral Surgery

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessments
This module is intended to provide information about and experience in dentoalveolar procedures in relation to: • Exposure and management of impacted teeth • Management of infra-occluded teeth • Management of high fraenal attachments	• Describe treatment options for the management of unerupted and impacted teeth through a combination of minor oral surgery and orthodontics • Describe the management options for encouraging tooth eruption • Describe the indications for fraenectomy	• Demonstrate the ability to make decisions for the management of unerupted and/or impacted teeth • Undertake appropriate treatment for the management of unerupted / impacted teeth • Apply appropriate treatment for the management of infra-occluded teeth	• Recognize the treatment options for managing unerupted and/or impacted teeth • Recognize the need to communicate the management options for unerupted / impacted teeth to the patient/parent, including the risks and benefits of each option • Recognize the need to advise patients / parents on the need and timing of fraenectomy	• Attend trainee lectures / seminars / tutorials • Independent study • Web based e-learning sources • Attendance at suitable courses • Attendance at suitable clinics and provision of patient treatment	• Workplace based assessments • Written exam and /or viva (SCR) • OSCE • MiniCEX

MODULE 31 –
Orthodontics and Restorative Dentistry

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessments
This module is intended to provide information about and experience in the role of orthodontics as adjunctive treatment in: • Repositioning periodontally stabilized teeth • Occlusal rehabilitation, including implantology • Restoration of the dentition including previously extracted teeth or minor hypodontia	• Explain the importance of an integrated treatment plan for joint orthodontic/ restorative care • Describe the timing of adjunctive orthodontic treatment in relation to restorative care • Identify where and when to refer complex cases	• Provide advice to fellow professionals and patients on adjunctive orthodontic treatment • Perform appropriate adjunctive orthodontic treatment	• Recognize the importance of an integrated treatment approach • Recognize the need for effective communication with fellow professionals and patients when considering adjunctive orthodontic treatment in restorative care • Recognize the need to refer complex cases to appropriate specialists	• Attend trainee seminars / tutorials • Independent study • Attendance at suitable courses • Attendance at suitable meetings • Attendance at suitable clinics and provision of treatment • Attend journal clubs	• Workplace based assessments • Written exam and /or viva (SCR) • OSCE • MiniCEX

MODULE 32 – Overview of Multidisciplinary Management of Facial Disharmony

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information regarding: • The recognition of facial disharmony • Diagnostic procedures used to identify the site of facial disharmony • The stages in the correction of facial disharmony • The stages in the management of cleft lip and/or palate patients	• Outline dentoalveolar compensation and adaptation • Explain the types of treatment offered to orthognathic patients • Outline the surgical procedures employed • Explain the timing of orthodontic treatment in orthognathic care • Explain the timing of orthodontic care in cleft lip and/or palate management	• Select those cases which cannot be treated by orthodontics alone • Communicate to patients an overview of orthognathic and cleft care	• Recognize the need for the explanation of treatment options and risks, including the risks of no treatment	• Attend trainee lectures / seminars / tutorials • Independent study • Web based e-learning sources • Attendance at suitable courses • Attendance at suitable meetings • Attendance at suitable clinics	• Workplace based assessments • Written exam and /or viva (SCR) • OSCE (Communication)

MODULE 33 – Management

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information relating to: • Personnel management • Financial management • Responsibilities and professionalism of a Specialist practitioner	With relevance to dental/specialist practice: • Outline employment law (including equality and diversity) • Outline the management of staff • Explain staff development procedures • Outline staff disciplinary procedures • Explain tax and financial record keeping • Describe indemnity related to the practice environment • State the requirements for patient record keeping	• Demonstrate interpersonal skills required to support a team for delivery of care	• Recognize the legal framework within which staff are employed • Recognize the importance of good record keeping • Recognize the importance of staff engagement and support	• Attend trainee seminars • Independent study • Web based e-learning sources • Attendance at suitable courses • Attendance at suitable meetings • Attend small group discussions / journal clubs	• Workplace based assessments • OSCE • DOPS

MODULE 34 –
Teaching and Communication

Objective	Knowledge	Skills	Attitudes	Teaching and Learning Methods	Assessment
This module is intended to provide information relating to: • Effective communication, both oral and verbal, with peers, practitioners, staff, patients and the public • Appraisal and assessment • Design and presentation of instructional sessions	• Describe the responsibilities of a clinical teacher and service lead • Outline the requirements for delivering an effective instructional session	• Demonstrate interpersonal skills for effective communication	• Demonstrate sensitivity and awareness in both verbal and non-verbal communication with patients and their parents/guardians • Demonstrate an open , patient and non-judgemental approach to answering questions	• Attend trainee seminars • Presentations at journal clubs • Attendance at suitable courses/ conferences • Attendance at suitable meetings • Attend small group discussions / journal clubs • Presentations to peers and others	• Workplace based assessments • OSCE (Communication) • ARCP feedback • Peer observation • MSF

2.5 Sequencing of Learning and Experience

The specialist training programmes commence with a laboratory based practical course ('typodont') for the development of orthodontic skills appropriate to the clinical situation. Trainees must demonstrate sufficient knowledge and skill before beginning clinical procedures on patients.

Whilst individual deanery programmes of study may vary the exact sequence of delivery of both the generic and specialist modules, the majority of the academic based modules will normally be completed within the first two years of the 3 year programme. Postgraduate deaneries will be informed as to which work based assessments should be completed as part of the ARCP process.

Where a university degree is being incorporated into the training, the dissertation may be completed at the end of either the second or third year depending upon the degree specification and local university regulations. For those academic trainees who are undertaking a PhD, the thesis would normally be submitted in year 4 or 5.

Clinical experiential learning through treatment of patients and by attendance at diagnostic and review clinics is embedded throughout all years of the programmes.

2.6 Methods of Assessment

An assessment blueprint exercise has been undertaken which maps appropriate assessment methods to the curriculum in a systematic manner and covers the domains of knowledge, skills and attitudes. Assessments are both formative and summative.

Continuing work-place based assessments including tests of knowledge, clinical and practical skills will be undertaken by each training centre for orthodontics. These may include miniCEX (clinical examination exercises), DOPS (direct observation of procedural skills) and MSF (multiple source feedback). Normally, trainees will be required to provide written reports reflecting on and describing their specific learning objectives in terms of patients for whom they have been responsible. Where appropriate, written assignments may be undertaken and if the training is linked to an associated taught course university higher degree; these may also form part of summative assessments for that degree.

In assigning methods of assessment to individual modules in the tables above (sections 2.4 to 2.6), the assessment includes not only those which may be undertaken within the training department(s) but also how those components of the curriculum are assessed in the Membership (MOrth). It is not intended that each component of the curriculum is assessed by each method. The assessment methods are indicative of the methods that may be used for each subject area, and should be applied as appropriate to the stage of training and circumstances of the training environment.

The examinations for the Membership of Orthodontics (MOrth RCS) are mapped to the appropriate curriculum and are taken towards the end of 3 years of full-time equivalent training.

The Membership examination of the joint Colleges (RCS England and RCPS Glasgow) includes; a written component (Multiple Choice Questions and Multiple Short Answers), tests of Structured Clinical Reasoning, Observed Structured Clinical Examinations (including test of communication skills) and the presentation of selected treated cases. The Membership examination of the Edinburgh Royal College comprises; MSAs, presentation of selected treated cases, SCR exercises, a communication exercise and a structured viva. Both examinations have been subjected to a blueprinting exercise which has mapped the assessment method to individual component of the curriculum. Both examinations are subject to a question validation exercise.

Overall progress will require a satisfactory evaluation report for each trainee including reflection on educational objectives. This is currently undertaken within the ARCP process conducted by the Postgraduate Dental Deaneries.

3. Model of Learning

3.1 How learning will be achieved

Clinical training must include; assessing new and review patients, examination, investigation, diagnosis and treatment planning, as well as the personal treatment of patients, which itself would normally occupy 50% of a trainee's time.

In addition to work-based experiential learning, all trainees must have access to formal teaching, lectures, staff-led seminars, tutorials and research supervision. The formal training modules map to the agreed national training modules which are available as web-based learning through the British Orthodontic Society. Additional training opportunities will include clinical meetings, student-led seminars ('Journal Clubs' or similar) and participation in audit (both self-directed and departmental meetings).

Due to the diversity of local clinical and academic networks, arrangements for aspects of training will vary. It should be noted that the achievement of learning within an appropriate setting, is dependent upon close cooperation between the Postgraduate Deaneries, the Training Programme Directors and the SAC. It is likely that this will involve time at a Dental Teaching Hospital, Regional Hospital units and Primary Care clinics.

In addition, the trainee should be able to attend national (and if appropriate international) training opportunities for the delivery of external teaching in discussion with their educational supervisor.

Throughout their training period, trainees should have time for independent study, including reading recommended texts, journals and using computer searches to access appropriate material on the internet.

3.2 Distribution of time within the training programme

3.2.1. The 3 year programme

The full-time trainee should spend at least 6 sessions per week involved in patient contact, with at least 5 of these sessions devoted to supervised personal treatment of patients. A balanced programme should include personal treatment, diagnostic sessions, review clinics, formal and informal teaching, research and reading time. Part-time training, or less than full time training, should be based on a minimum of 6 sessions per week and include at least 3 personal treatment sessions.

Table 1: The table below gives details of training times and clinical sessional distribution:

Trainee	Training time (years)	Weekly sessions	Total clinical sessions	Personal treatment	Other – diagnostics, review clinics etc
Full-time trainee	3	10	6	5	1

Table 2: The table below gives the sessional distribution within non-clinical sessions:

Trainee	Total sessions	Total clinical sessions	Total non-clinical sessions	Non-clinical being taught	Non-clinical research, study, audit	Non-clinical management, administration
Full-time trainee	10	6	4	1.5	2	0.5

The time devoted to the research component and how those sessions are dispersed over two or three years of the programme will depend on degree specifications and individual university regulations. The number of research dedicated sessions, on average, should not normally exceed two per week for master's level degrees but this should be revised in the light of local university regulations for other higher degrees.

The time devoted to the research component and how those sessions are dispersed over two or three years of the programme will depend on degree specifications and individual university regulations. The number of research dedicated sessions, on average, should not normally exceed two per week for Master's level degrees but this should be revised in the light of local university regulations for other higher degrees.

3.3 Clinical Experience and Caseload

The objective of the training programmes is to equip the trainee, at the end of the training period, with the knowledge, skills, attitudes and competence to provide the services of a specialist Orthodontist normally practising in a Primary Care setting. This objective should, in part, be met by having sufficient clinical experience to ensure that the development of these characteristics is both realistic and achievable within the work-based experiential environment. Whilst individual trainees will vary in their ability and progress in developing and achieving the appropriate knowledge, skills and attitudes, the following is a guide as to the anticipated patient caseload.

A total of 80 to 120 cases would be appropriate. A guide figure of 65 to 90 cases treated using a primary appliance system, 10 to 20 additional cases employing growth modification, and 5 to 10 cases involving a minor element of interdisciplinary care might be anticipated.

Case loads should be modified *pro rata* for part time trainees. It is not intended that the figures should be prescriptive but rather to be helpful as guidelines. All trainees would be expected to keep a logbook of their caseload, which should be reviewed as part of the ARCP process.

3.4 Out of Programme Training

In view of the longitudinal nature of orthodontic care, it is important that, whenever possible, trainees do not take time out of training for extended periods. It would be unusual, therefore, for trainees to take periods of detachment from training programmes, for training in other centres, either abroad or in the UK.

4. Learning Experiences

It is important that trainees are exposed to the clinical and academic views of more than one trainer, and this would normally occur through the training units being part of managed clinical and academic networks. The location of sessions will vary between training programmes and the Deaneries will be responsible for quality managing the appropriate location for training depending upon the local situation. However, it would normally be expected that the majority of sessions in the first year of training are in the university dental school together with associated secondary care environments. These could be the dental teaching hospital or regional unit.

For trainees on this programme, some clinical sessions may be held in primary care settings in the second and third years. Overall, a balanced approach should be presented such that the trainee has a solid core of knowledge against which to make evidence based judgements and gain perspectives of the range and effectiveness of contemporary orthodontic therapy as well as combined medical, surgical and dental care where appropriate.

Equally, it is important that trainees must not feel isolated and it is essential that there must be access to peer interaction with colleagues. This is especially important where training is provided away from the secondary care or university dental hospital setting.

Programmed sessions must be available for study and personal reflection, in addition to sessions devoted to research and to the development of teaching skills.

4.1 Training Capacity of the Programme

In a centre with adequate physical and human resources to support training, capacity is limited principally by the staff: student ratio. In accordance with the European Erasmus report guidelines[3] any programme which exceeds two or more of the following guidelines may be seen as exceeding its resources to deliver an acceptable quality of training. This is especially important where the demands of non-CCST orthodontic students or trainees may dilute the potential for teaching and training.

- Clinical experiential training: In many Regional Hospital units and Primary Care settings chairside teaching usually approaches a 1:1 ratio. In Dental Hospitals there may be more students per member of staff. The absolute maximum should be a ratio of 1:6.
- Didactic teaching: It is beneficial for student interaction that groups should not be smaller than 3 but that there should be a maximum size of 8 for seminar/ tutorial based teaching. Larger groups are acceptable for a lecture format.
- Research degree dissertation: depending upon other commitments it is suggested that a supervisor should undertake supervision of no more than 5 projects at any one time. Individual university programmes may have local regulations in place.

5. Supervision of Trainees and Feedback

5.1 Educational Support

Close supervision of the trainee is essential to ensure appropriate educational support as well as patient and trainee safety. Each clinical session involving patient contact must have a designated supervisor available, with committed time devoted to the trainee.

All trainees will have an educational supervisor or trainer and each training centre or group of programmes will have a Training Programme Director (TPD) appointed by the Postgraduate Deanery. The TPD is responsible for the organisation and day to day management of the training programme. In addition, trainees are normally expected to have access to a tutor for pastoral care. Where the training programme is linked to a university dental hospital and school, the tutor is usually provided from that setting.

Informal appraisals by the trainer should be undertaken throughout the training period in order to monitor and advise on a trainee's progress and training needs. A confidential record between the trainer and trainee should be kept of these meetings, which should occur at least twice a year. A formal appraisal must be held towards the end of each year of training or as appropriate. These appraisals should precede and inform the Deanery ARCP review process.

All assessments must be supported by structured feedback for trainees. Trainees who are unable to achieve the appropriate standard in an assessment or examination may, with the agreement of their trainers and TPD, repeat that examination or assessment but they need to be aware of, and comply with, local and national examination regulations. Counselling is an important component of trainee care and access must be provided for educational support. Early identification of trainees unsuitable for a career in orthodontics or experiencing difficulty with training is essential, in order to provide appropriate support and guidance. Normally, this should be within the first six months of the programme.

5.2. Trainer and Supervisors' Training

The quality and ability of the trainers is an important element in successful training. Trainers must possess appropriate experience, commitment, knowledge and skill as demonstrated, where appropriate, by accredited Clinical Teacher status, ideally including membership of a Higher Education Academy.

All trainers and supervisors must undertake Continuing Professional Development and Audit and be part of a managed clinical teaching network. It is expected that trainers will be in possession of a teaching certificate or equivalent, and engage in a teaching and learning programme depending on local arrangements.

6. Managing Curriculum Implementation

The Postgraduate Deaneries are responsible for quality management of the training programme. The SDEB will quality assure the Deaneries and the educational providers are responsible for local quality control, managed by the Deaneries.

As the actual content of the 3 year curriculum essentially follows that of the previous revision, subject to minor variations, implementation should be relatively seamless. Once approved, it is anticipated that trainees commencing their training in 2011 will follow this amended version of the curriculum. The Deaneries will ensure that the sites for delivery of the curriculum are appropriate and fit for purpose, and, with regard to training in primary care setting, pilot schemes are currently being investigated. It is essential that changes to the delivery of the programme are not made until positive outcomes have been demonstrated from such pilot schemes following appropriate evaluation. The exit examination for the 3 year training in the specialty of Orthodontics is the MOrth RCS. At present, trainees can sit either the joint bicollegiate examination of the RCS England and RCPS Glasgow, or the separate MOrth examination offered by the RCS Edinburgh. The curriculum is common for both examinations. In due course a tricollegiate examination is expected to evolve.

7. Curriculum review and update

The SAC will continue to ensure that the curriculum is fit for purpose in that it provides the trainee with the appropriate knowledge, skills, attitudes and competencies required to meet the requirements of a specialist orthodontic workforce normally delivering specialist orthodontic care in the primary care setting. Curriculum review will be informed by a number of different processes and information may be gathered from sources which might include; the Lead Postgraduate Dean for Orthodontics, Training Programme Directors and Educational Supervisors, University leads, the trainees, the BOS and representatives of the Department of Health. This list is not exhaustive. Any suggested updates will only be made following appropriate consultation with stakeholders, including trainees and lay members. Updates must be approved by the JCPTD before passing to the GDC for consideration.

At the date of this document, both the SAC and the JCPTD have expressed their concern to the GDC that the additional post-CCST training to provide competence in the management of more complex multidisciplinary cases is currently outwith the quality assurance process. A proposal for a revised, seamless 5 year training programme leading to a separate CCST has been drafted and will be considered as part of the GDC's review of Specialist Lists in 2011. Depending upon the outcome of that review further amendments to the current 3 year training programme may need to be considered.

8. Equality and diversity

8.1- Statutory responsibilities

The SAC is committed to the principle of diversity and equality in employment, membership, academic activities, examinations and training. As part of this commitment we are concerned to inspire and support all those who work with us directly and indirectly.
Integral to our approach is the emphasis we place on our belief that everyone should be treated in a fair, open and honest manner. Our approach is a comprehensive one and reflects all areas of diversity, recognising the value of each individual. We aim to ensure that no one is treated less favourably than another on the grounds of ethnic origin, nationality, age, disability, gender, sexual orientation, race or religion. Our intention is to reflect not only the letter but also the spirit of equality legislation.

Our policy will take account of current equality legislation and good practice. Key legislation includes:

· The Race Relations Act 1976 and the Race Relations Amendment Act (RRAA) 2000
· The Disability Discrimination Act 1995 and subsequent amendments
· The Sex Discrimination Act 1975 and 1986 and the 1983 and 1986 Regulations
· The Equal Pay Act 1970 and the Equal Pay (Amendment) Regulations 1983 and 1986
· The Human Rights Act 1998
· The Employment and Equality (Sexual Orientation) Regulations 2003
· The Employment and Equality (Religion or Belief) Regulations 2003
· Gender Recognition Act 2004
· The Employment Equality (Age) Regulations 2006

9.0 References

1 Review of NHS Dental Services in England, 2009. Professor J.Steele

2 18 week wait Commissioning Pathway for Orthodontics, Department of Health, England 2008

3 Three years Postgraduate Programme in Orthodontics: The Final report of the Erasmus Project. FPGM van der Linden. European Journal of Orthodontics 1992. 14: 85-94

4 Advisory Committee on the training of dental practitioners report on the field of activity and training programmes for the dental specialists. 1986 European Commission Directive number III/D/1374/5/84-EN.

5 Draft Proficiencies of the Advisory Committee on the training of Dental Practitioners. 2004 European Commission Directive number 78/687/EEC.

6 The World Federation of Orthodontists (WFO) guidelines for postgraduate orthodontic education. World Journal of Orthodontics 2009. 10: 153-166

7 Interim Memorandum of understanding between the General Dental Council (GDC) and the members of the Joint Committee for Specialist Training in Dentistry (JCSTD), 2008

APPENDIX 1

MODULAR TRAINING PATHWAYS IN ORTHODONTIC SUBJECTS

The table below indicates the curriculum content covered by the 3 year training programme leading to the CCST in the Specialty of Orthodontics. The table also includes those aspects of training currently provided as part of the additional 2 year FTTA (post-CCST training). Shaded boxes indicate the curriculum content (syllabus) appropriate to the various pathways. Please note the format of the 5 year training programme will be re-considered as part of the GDCs Specialist List Review scheduled for 2011.

Module number	Module Title	Module contents	CCST Orthod	5 year training (currently CCST + FTTA training)
Generic Components				
1	**Cell and Molecular Biology with genetics**	Bone cells & origins*		
		Bone composition, types & functions		
		Bone development		
		Intramembranous & endochondral ossification*		
		Bone growth & remodelling		
		Regulation of skeletal metabolism		
		Bone disorders of relevance to orthodontics		
		Basic histology & early tooth development*		
		Biology of tooth development*		
		The odontogenic homeobox code		
		Tooth morphogenesis and agenesis*		
2	**Embryology, growth and development of the face and jaws**	Basic biology*		
		Development of pharyngeal apparatus & associated disorders*		
		Facial development & associated disorders*		
		Palate development & associated disorders*		
		Skull and mandible development & associated disorders*		
		Theories and patterns of facial growth		
		Development of the dentition and periodontium*		
		Genetics vs Environment in postnatal growth*		
		Postnatal growth of hard and soft tissues*		
3	**Psychology**	The importance of facial aesthetics		
		Psychological aspects of treatment		
		Overview of psychology of orthognathic		

		surgery and cleft deformities		
4	Research with information and computing technology	Critical appraisal of literature		
		IT resources		
		Literature searches and literature reviews		
		Systematic reviews		
		Statistics		
5	Radiological imaging techniques	Ionising radiation regulations*		
		Selection criteria & justification*		
		Principles of radiation physics*		
		Risks of ionising radiation and dose limitation*		
6	Oral Health	What is oral health?		
		Oral health and malocclusion		
		IOTN / ICON indices		
		Avoidance of caries and periodontal disease		
		Risk/ benefit assessment of orthodontic treatments*		
7	Dental Health Education	Team care orthodontics		
		Psychology of patient motivation		
		Patient information leaflets and video		
		Development of patient communication skills		
		Development of patient motivation skills		
8	Health and Safety	Health and safety at work		
		COSHH and risk assessment		
		Radiology		
		Clinical health and safety		
9	Clinical governance	NHS policies and procedures		
		Clinical governance including audit and ethics		
		Equality and Diversity as relevant to patient care		
Specialist components				
10	Normal and abnormal development of dentition	Normal dental development		
		Abnormal development of deciduous dentition		
		Abnormal development of permanent dentition		
11	Temporomandibular dysfunction and orthodontics	The importance of TMD in orthodontics		
		Anatomy & physiology of the TMJ*		
		Measuring TMD		
		Assessing TMD in orthodontic patients		
		Management of TMD		
12	Tooth movement and facial orthopaedics	Exfoliation, tooth eruption and posteruptive tooth movement		
		Orthodontic tooth movement and bone metabolism*		
		Theories of orthodontic tooth movement		
		Root resorption		

		Facial orthopaedics		
		Methods of applying orthopaedic forces		
13	**Orthodontic materials and Biomechanics**	Orthodontic materials*		
		Response to forces		
		Iatrogenic effects of orthodontics		
		Mechanics of tooth movement		
		Determinate / Indeterminate force systems		
		Anchorage		
14	**Aetiology of Malocclusion**	Genetic factors		
		Skeletal factors		
		Soft tissue factors		
		Equilibrium theory		
		Respiratory effects		
		Habits		
		Local / dental factors		
		Specific aetiologies in Class II div 1, Class II div 2, Class III malocclusions		
15	**Airway, craniofacial development and malocclusion**	Principles of respiratory physiology*		
		Upper airway respiration		
		Upper airway and craniofacial development		
		Obstructive sleep apnoea		
16	**Diagnostic procedures**	Clinical examination		
		Radiographic examination		
		Study models and space analysis		
		Clinical photography		
		Scanning procedures		
		Special Tests		
17	**Treatment Planning**	The scope and limitations of orthodontics		
		Stability of treatment		
18	**Growth, treatment analysis and cephalometry**	Imaging techniques		
		Cephalometric landmarks and measurements		
		Cephalometric analyses		
		Superimpositions		
		Problems with cephalometrics		
		Uses and timings of lateral cephalometry		
		Growth prediction		
19	**Long-term effects of orthodontic treatment**	Nature and presentation of relapse		
		Aetiology of relapse		
		Consent and long term effects		
		Malocclusion type and relapse		
		Treatment effects and stability		
		Retention methods		
		Adjunctive methods		
		Current research and controversies		

20	**Iatrogenic effects of orthodontic treatment**	Risks of treatment to face, teeth, soft tissues, supporting tissues		
		Minimising iatrogenic effects		
		Predisposing factors		
		TMJ and orthodontics		
21	**Epidemiology in orthodontics**	Orthodontic need and demand		
		Ethnic, gender and social aspects of orthodontic treatment provision and demand		
22	**Orthodontic literature and research**	Preparing a literature review		
		Literature search		
		Managing references		
		How to write an article		
		Prepare and submit MSc, DDS or equivalent		
		Prepare and submit scientific papers		
23	**Removable appliances**	Advantages and disadvantages		
		Mode of action		
		Design and construction		
		Clinical management		
24	**Functional appliances**	Indications		
		Design, construction and clinical management		
		Mode of action		
		Class II and Class III appliances		
		Timing		
		Appliance types		
		Fixed functional appliances		
		Integration of functional and fixed treatments		
25	**Extra-oral appliances**	Indications		
		Mode of action		
		Force magnitude, direction, duration		
		Asymmetric headgear		
		Alternative unilateral methods of distal movement of teeth		
		Practical / clinical aspects		
		Protraction headgear		
26	**Fixed appliances**	Development		
		Scope and limitations		
		Indications / Contraindications		
		Design, manufacture, construction		
		Welding / soldering		
		Placement		
		Anchorage planning and control		
		Appliance types / prescriptions		
		Flexible components		
		Intraoral auxiliaries		
		Temporary anchorage devices		

27	**Retention appliances**	Post retention changes in face and jaws		
		Effect of different treatment modalities		
		Post treatment retention - why and how?		
		Design and use of retention devices		
		Duration and requirements in light of current evidence		
28	**Guiding the development of the occlusion**	Interceptive orthodontics		
		Elimination of local factors		
		Early loss of teeth		
		Early skeletal correction		
		Treatment of crossbites		
		Interceptive orthodontics		
29	**Adult orthodontics**	Motivation for treatment		
		Periodontal considerations		
		TMJ considerations		
		Comprehensive and compromise treatments		
		Adjunctive treatment		
30	**Orthodontics and Minor Oral Surgery**	Management of unerupted and impacted teeth		
		Infraoccluded teeth		
		Fraenectomy		
31	**Orthodontics and restorative dentistry**	Orthodontic movement in periodontal patients		
		Integration of orthodontics with restorative treatment		
32	**Overview of multidisciplinary management of facial disharmony**	Diagnosis of facial disharmony		
		Overview, indications, sequences of orthognathic treatments		
		Overview of cleft lip and palate management		
33	**Management**	Ethics		
		Consent		
		Relationships and communication		
		Malpractice and risk management		
		Negligence and standards of care		
		Acting as an expert		
		Clinical records, ethics and law		
		Employment law incl equality and diversity		
		Personnel management		
		Finance and taxation		
		Record keeping		
34	**Teaching and communication**	Teaching methods and their application		
		e-learning		
		Feedback processes, appraisal and assessment		

		Presentation skills		
		Communicating with patients, parents and practitioners		
Additional components currently covered as part of post-CCST training				
35	**Psychology in relation to Craniofacial abnormality**	Orthognathic treatment		
		Cleft lip and palate		
		Dental science and body dysmorphic disorder		
		Dental science and eating disorders		
36	**Advanced cephalometrics and imaging**	Cephalometrics for orthognathic treatment		
		Digital imaging and 'morphing' programs		
		3D imaging		
		3D Facial scanning		
37	**Orthognathic treatment**	Diagnosis of facial disharmony		
		Presurgical orthodontic procedures		
		Surgical procedures		
		Postsurgical management		
		Perioperative management of surgical patients		
		Management of severe transverse skeletal abnormalities		
		Management of facial asymmetry and Asymmetrical mandibular growth – orthodontics		
		Hybrid functional appliances		
		Management of facial asymmetry and asymmetrical mandibular growth – orthognathic treatment and plastic surgery		
38	**Multidisciplinary management of medically compromised patients**	Interaction with other hospital medical specialities		
		Management of special needs patients		
		Management of juvenile arthritis		
		Management of musculo-skeletal disorders		
39	**Orthodontic management of patients with special needs**	Categorization of conditions requiring support		
		Learning /functional difficulties		
		Psychosocial background		
		Limitations of orthodontic treatment		
40	**Distraction osteogenesis**	Craniomandibular distraction techniques		
		Biological changes		
		Maxillofacial applications		
		Devices		
		Intraoperative management		
		Postoperative management and outcomes		
		Complications		
41	**Multidisciplinary care of cleft lip and palate**	CSAG report		
		Classification and development		

	patients	Associated medical and dental anomalies		
		'Hub and spoke management'		
		Specialist management birth to adult - overview		
		Antenatal and neonatal management		
		Outreach nursing		
		Comprehensive multidisciplinary management		
		Surgery to lip and palate		
		Speech development		
		Hearing		
		Dentofacial development and management		
		Alveolar bone grafting		
		Orthodontic treatment during adolescence		
		Post-surgical facial growth		
		Orthognathic Surgery		
		Long-term management		
		Future developments		
42	**Multidisciplinary care of Craniofacial deformities**	Basic concepts and genetics		
		Orofacial clefting -aetiology		
		1st and 2nd branchial arch malformations - overview		
		Chondrodysplasias -overview		
		Craniosynostoses / Cleidocranial dysplasias		
		Cherubism		
		'Hub and spoke management & NCG		
		Specialist management of 1st and 2nd arch malformations - orthodontics		
		Multidisciplinary management of 1st and 2nd arch craniofacial anomalies		
		Chondrodysplasias - specialist management		
		Multidisciplinary management of chondrodysplasias / cleidocranial dysplasias		
43	**Hypodontia**	Interdisciplinary management of moderate and severe hypodontia		
44	**Management in Secondary care**	Impact of NHS directives on secondary care		
		18 week wait for treatment		
		Legal framework of activity as relates to hospital staff		
		Budgeting and finance in secondary care		
45	**Teaching and Training**	Teaching and training methods and their application		
		e-learning		
		Feedback processes		
		Managing the failing trainee		

* Trainees will be exempt the denoted components of these modules if in possession of the Part 1 MOrth examination.