Curriculum for Specialist Training in Dental and Maxillofacial Radiology

Examination Board for the Diploma in Dental Radiology of the Royal College of Radiologists on behalf of the Dental and Maxillofacial Radiology Subcommittee of the Specialty Advisory Committee for the Additional Dental Specialties

British Society for Dental and Maxillofacial Radiology

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Introduction

Dental and Maxillofacial Radiology in the UK is a Dental specialty overseen by the General Dental Council and Dental and Maxillofacial Radiologists must be registered on the specialist list in Dental and Maxillofacial Radiology of the GDC. The award of the Certificate of Completion of Specialist Training (CCST) will require evidence of satisfactory completion of training in all aspects of Dental and Maxillofacial Radiology which are outlined in this curriculum.

The curriculum takes as its guidance a number of documents including:

- The Postgraduate Medical Education and Training Board's (PMETB) *Standards for Curricula*
- The PMETB's *Principles for an Assessment System for Postgraduate Medical Training*
- The Royal College of Radiologists, new Core and Special Interests curricula being prepared for submission to PMETB
- *The Dental Gold Guide*.

All examinations and assessments undertaken during training will be clearly linked to the content of the curriculum.

Entry requirements

Entry to a Dental and Maxillofacial Radiology training programme in the UK may follow the satisfactory completion of:

- a two year period of Foundation Training which may include a period of vocational training (VT), but should also include a period of training in secondary care in an appropriate cognate specialty
- the possession of the FDS, MFDS or MJDF of the UK Surgical Royal Colleges or an equivalent qualification
- candidates without FDS, MFDS or MJDF may be admitted to a programme but will normally be expected to possess an appropriate higher degree and/or to have had appropriate experience in dental and maxillofacial radiology or a related discipline.

Duration of training

The Royal College of Radiologists anticipates that four years would normally be required to satisfactorily complete the radiology curriculum to the required depth and breadth, as identified in Schedule 3 of the General and Specialist Medical Practice (Education, Training and Qualification) Order 2003, and all provisional CCST dates should be set at four years (48 months) in the first instance.

The CCST in Dental and Maxillofacial Radiology will be awarded on the recommendation of the local Postgraduate Dental Dean following:

- evidence of satisfactory completion of the Dental and Maxillofacial Radiology curriculum and the minimum training period

- satisfactory outcomes in the requisite number of workplace-based assessments (including multi-source feedback)
- Diploma in Dental Radiology of The Royal College of Radiologists (DDRRCR) by examination.
- acquisition of ACRP (Annual Review of Competency Progression) Appendix 5 (*The Dental Gold Guide*). The Royal College of Radiologists is developing an ARCP decision grid for each year of training for all radiology trainees for implementation in 2010 following approval by PMETB.)

Flexible training

'Less than full-time' is the term used to describe doctors and dentists undertaking training on a flexible basis, normally between five and eight sessions per week. The aim of flexible training is to provide opportunities for doctors and dentists in the NHS who are unable to work full time. Doctors and dentists can apply for flexible training if they can provide evidence that "training on a full-time basis would not be practicable for well-founded individual reasons".

Flexible trainees must accept two important principles outlined in European law (Directive 93/16/EEC):

- part-time training shall meet the same requirements (in depth and breadth) as full-time training
- the total duration and quality of part-time training of specialists must be not less than those of a full-time trainee. In other words, a part-time trainee will have to complete the minimum training time for their specialty pro rata.

For SpRs, the regulations governing flexible training are outlined in section 6.39 of *The Dental Gold Guide*.

Trainees must have their flexible training approved by the local Postgraduate Dean for less than full time Training before beginning their flexible training. The local Postgraduate Dental Dean may seek advice from the SAC with regard to the amended length of training

Research

Some trainees may wish to spend a period of time in research, either before entering Dental and Maxillofacial Radiology training or as 'Out-of-Programme Research' (OoPR) after entering a training programme.

Research undertaken prior to entry to the training programme

Trainees who have undertaken a period of research that includes *clinical work directly relevant to the Dental and Maxillofacial Radiology curriculum*, prior to entering the training programme, can have a maximum of one year approved by the SAC towards their CCST. Such trainees should normally apply for approval of this period of research at the commencement of training. In accrediting any prior research towards the award of a CCST the outcomes achieved previously will be mapped across onto those stated in the curriculum. Following completion of at least six months (whole-time equivalent) of training the trainee's educational supervisor should assess their progress to determine the suitability of their previous period of research

to be counted towards the CCST. Any period of research to be counted towards the CCST should be agreed by the Programme Director, who will make a recommendation to the SAC.

Research undertaken after entry to a dental radiology training programme

Trainees who have undertaken a period of research that includes *clinical work directly relevant to the Dental and Maxillofacial Radiology curriculum*, after entering the training programme, can have up to one year approved by the SAC towards their CCST.
It is recommended that trainees wishing to undertake research as OoPR do so after completing a minimum of 2 years of training and after successfully passing the DDR Part A examination.

Trainees must have their OoPR approved by their Postgraduate Dental Dean before beginning their research. The Postgraduate Dean may seek advice from the SAC with regard to the OoPR request.

Out of Programme Experience elsewhere in the UK or overseas

Some trainees who have been awarded an NTN may wish to spend a period of training in another UK or overseas Institution as OoPE after entering a Dental and Maxillofacial Radiology training programme. It is recommended that trainees wishing to undertake overseas training as OoPE do so after completing a minimum of 2 years of training and after successfully passing the DDR Part A examination. Normally, the experience to be gained in their OoPE programme will not be available in their own unit but is essential for the completion of training.

Trainees must have their OoPE overseas training approved by their Postgraduate Dental Dean before beginning their overseas training. The Postgraduate Dean may seek advice from the SAC with regard to the OoPE request.

Related clinical training

During their Dental and Maxillofacial Radiology training, some trainees may wish to spend a period of training in a related clinical specialty such as Oral Medicine, Oral and Maxillofacial Pathology, Head and Neck Radiology or Oncology, etc. This is acceptable and should be undertaken as OoPE. However, such a period of training – although useful to the individual trainee in broadening their understanding of the relationship between dental radiology and the clinical specialties, – will not be approved by the SAC towards the requirements of the CCST. This training experience may lengthen the time taken to achieve a CCST.

Rationale

Purpose of the curriculum

The purpose of the curriculum for specialist training in *Dental and Maxillofacial Radiology* is to set the standards required by the GDC for attainment of the award of the Certificate of Completion of Specialist Training (CCST) in Dental and Maxillofacial Radiology, and to ensure that trainees are fully competent to provide a high quality service at consultant level in the NHS.

The educational programme provides:

- experience of the diagnostic imaging investigations required to become technically competent in practical clinical work, and to master the underlying theoretical principles
- the opportunity to develop relevant skills in CT, MRI, ultrasound and nuclear medicine relevant to Dental and Maxillofacial Radiology
- training in the communication and teaching skills necessary for effective practice
- the acquisition of the ability to provide specialist opinion in dental and maxillofacial radiology
- the acquisition of management skills to lead a department providing an effective service
- experience of research and development projects and critical assessment of published work so as to contribute in a team and individually to the development of the service
- the acquisition of life-long habits of reading, literature searches, consultation with colleagues, attendance at scientific meetings, and the presentation of scientific work that are essential for continuing professional development (CPD)
- experience of the practice of clinical governance and audit (specialist and multidisciplinary) through evaluation of practice against the standards of evidence-based medicine, which underpin radiology practice.

Clinical governance is defined by the Department of Health as 'a framework through which NHS organisations are accountable for continuously improving the quality of their services and safeguarding high standards of care, by creating an environment in which excellence in clinical care will flourish.' In dental radiology, trainees must acquire knowledge of the lines of accountability, quality improvement programmes, clinical audit, evidence-based practice, clinical standards and guidelines, managing risk and quality assurance programmes. Training in these areas must continue throughout all stages of the curriculum. Trainees must be aware of the professional guidance issued by the General Dental Council in their document *Standards for Dental Professionals*, and by the Senate of Dental Specialities in *Good Practice in the Dental Specialties.*

The award of a CCST will indicate suitability for independent professional practice. During training, trainees will be able to use the curriculum to monitor their progress towards this goal. Formal assessments and examinations will be based on curricular objectives. The curriculum will facilitate regular assessment of trainees' progress by trainees and their trainers.

Curriculum development

This curriculum was developed by the Examination Board for the Diploma in Dental Radiology of The Royal College of Radiologists on behalf of the Dental and Maxillofacial Radiology Subcommittee of the Specialty Advisory Committee in the Additional Dental Specialties. The DDR Examination Board is made up of four medical radiologists and four dental and maxillofacial radiologists including members of the British Society of Dental and Maxillofacial Radiology (BSDMFR). Consultant Dental and Maxillofacial Radiologists in Dental Schools in the UK and trainees were consulted and invited to comment on the content of the curriculum.

Stages of training and learning

The programme of training in Dental and Maxillofacial Radiology takes four years (48 months) before a CCST can be awarded. The training programme is divided into four stages:

A period, normally of six months, leading to the First FRCR (Physics module) examination
During this period comprehensive radiation physics and radiation protection in relation to all aspects of medical imaging will be taught and may involve attendance at a relevant Royal College of Radiologists course.

A period, normally of eighteen months, leading to the DDR Part A examination.
This period comprises 18 months training in dental and maxillofacial radiology including secondments in general radiology. Because departments have different local arrangements and configurations it is not possible or desirable to be prescriptive about how this period should be organised. The required secondments in general radiology will usually comprise specified, timetabled blocks of time. In general, it is considered desirable for trainees to have a period of dental and maxillofacial radiology experience and generic skills training before entering a general radiology department. During the period(s) of general radiology training it is expected that trainees will have the opportunity to participate in the activities of the general radiology department with their general radiology trainee colleagues.

Trainees can sit the DDR Part A examination, which tests the candidate's knowledge of dental radiology, anatomy, techniques, radiation physics and protection after a minimum of 18 months of training

A period, normally of a further eighteen months, leading to the DDR Part B examination.
This period of training commences after successful completion of the DDR Part A examination and comprises a further 18 months of more advanced specialty training in order to gain competencies in the full range of dental and maxillofacial and relevant head and neck radiology. As in the first period of training it is not possible or desirable to be prescriptive about how this period should be organised. The required secondments in head and neck radiology will again comprise specified, timetabled blocks of time.

Trainees can sit the DDR Part B examination, which is a realistic test of clinical maxillofacial radiology, after a minimum of 36 months from commencement of training.

A period of post DDR training leading to the CCST
This period of training commences after successful completion of the DDR Part B examination and comprises a period of preparation for a consultant post. For some trainees, this period will be short, since it is expected that the DDR Part B examination may be taken close to the 48 month limit of training. For all trainees however, regardless of when the examination was passed the total time in training is normally 48 months.

In order to complete training and be recommended for the award of a CCST trainees must have:

- satisfactorily completed 48 months of training (whole-time equivalent).
- satisfactorily completed all areas of the curriculum
- passed First FRCR(Physics), DDR Part A and DDR Part B examinations in Dental and Maxillofacial Radiology
- obtained an ARCP form Appendix 5 (The Dental Gold Guide) to indicate final record of satisfactory progress.

Deanery Training programmes

Deanery Training programmes will be externally quality assured by agencies approved by the GDC and training posts should be recognised for education and training by the relevant Postgraduate Dean. Training programmes should include suitable rotational arrangements to cover all the necessary areas of the curriculum and may include an appropriate balance between teaching hospitals, district general hospitals and specialist units, such that each trainee gains the breadth of training required for satisfactory completion of the curriculum.

Content of Learning

The curriculum details the level of knowledge and skill that a trainee should acquire to provide a high quality service at consultant level in the National Health Service (NHS). The general professional and specialty-specific content of the curriculum is outlined below.

1. Basic knowledge and skills
2. Dental and Maxillofacial Radiology
3. Relevant aspects of Head and Neck radiology

The curriculum outlines the knowledge, skills, and behaviour that a trainee is expected to obtain in order to achieve the award of the CCST.
On completion of the training programme, the trainee must have acquired and be able to demonstrate:

- appropriate clinical knowledge and behaviour in order to be able to work as a consultant dental and maxillofacial radiologist
- good working relationships with colleagues and the appropriate communication skills required for the practice of dental radiology
- the knowledge, skills and behaviour to act in a professional manner at all times

- the knowledge, interpretative skills and behaviour to provide appropriate teaching and to participate in effective research to underpin the practice of dental and maxillofacial radiology
- an understanding of the context, meaning and implementation of clinical governance
- a knowledge of the structure and organisation of the NHS
- the acquisition of management skills required for the running of a dental and maxillofacial imaging department
- familiarity with health and safety regulations, as applied to the work of a dental and maxillofacial radiology department.

Methods of assessment

The purpose of the assessment system follows the guidelines of The Royal College of Radiologists' and the principles laid down by the PMETB (*Principles for an assessment system for postgraduate medical training*). The purposes of the assessments include:

- indicate suitability of choice at an early stage of the chosen career path
- indicate the capability and potential of a trainee through tests of applied knowledge and skill relevant to the specialty
- demonstrate readiness to progress to the next stage(s) of training having met the required standard of the previous stage
- provide feedback to the trainee about progress and learning needs
- support trainees to progress at their own pace by measuring a trainee's capacity to achieve competencies for their chosen career path
- help to identify trainees who should change direction or leave the specialty
- drive learning demonstrated through the acquisition of knowledge and skill
- enable the trainee to collect all necessary evidence for the Annual Review of Competence Progress (ARCP)
- gain the Diploma in Dental Radiology of the Royal College of Radiologists
- provide evidence for the award of the CCST
- assure the public that the successful trainee is ready for unsupervised professional practice as a specialist.

Trainees will be assessed in a number of different ways during their training. Satisfactory completion of all assessments and examinations will be monitored as part of the ARCP process and will be one of the criteria upon which eligibility to progress will be judged. A pass in the First FRCR(Physics), DDR Part A and DDR Part B examinations are required as part of the eligibility criteria for the award of the CCST.

Assessment of Trainees will take two forms:

Examinations

The First FRCR(Physics), DDR Part A and DDR Part B examinations in Dental and Maxillofacial Radiology.

Workplace-based assessments

The principal form of continuous assessment of progress and competence will be workplace-based assessments throughout the entire duration of training. It is envisaged that the scheme for workplace–based assessments will follow the scheme developed by the Royal College of Radiologists for general radiology trainees. It is recommended that assessors and trainees in dental and Maxillofacial radiology follow these guidelines and also use the assessment forms available from the Royal College of Radiologists. This will ensure continuity of assessment methods and parity with trainee colleagues in general radiology, which is especially important when Dental and Maxillofacial radiology trainees are working in a general radiology environment.

The principle of workplace-based assessments (WpBAs) is that trainees are assessed on work that they are doing on a day-to-day basis and that the assessments are integrated into their daily work. This is particularly relevant to radiology which is a closely supervised and consultant-led training environment.

The assessment process is **initiated by the trainee,** who should identify opportunities for assessment throughout their training. The trainee should therefore choose the assessment tool, the procedure and the assessor. Assessments should be undertaken by a range of assessors and should cover a broad range of activities and procedures appropriate to the stage of training.

The assessment methods being recommended by The Royal College of Radiologists as appropriate for use in radiology are:

- Mini-image interpretation exercise (mini-IPX)
- Direct observation of practical skills (Rad-DOPS)
- Multi-source feedback (MSF). This may involve formal 360^0 feedbacks or, more usually, feedback from trainers for an annual assessment by the Educational Supervisor or Programme Director
- Audit assessment
- Teaching observation

It is also expected that trainees will participate in individual or group tutorials which may also involve a degree of assessment. These may inform trainers when feeding back to Programme Directors as part of the MSF process.

The assessment methods are blueprinted to the curriculum in the tables that follow. 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. Trainees should note that the DDR examinations are wide ranging and most subject areas covered in the curriculum may be formally examined.

Evidence of competence

The Royal College of Radiologists does not have any supportive evidence as to the ideal minimum workload figures that will result in a satisfactory level of competence. It is recognised that this will differ according to the ability and aptitude of individual trainees and their learning environment. It is believed that a diverse range of material seen under the appropriate supervision and guidance of an educational/training supervisor is a superior method of working. Detailed procedures observed by the educational/training supervisor and judged to be satisfactory will be recorded in the trainee's training and learning record. A correctly maintained and up to date logbook (incorporated within the new Royal College of Radiologists' e-Portfolio to be rolled out in 2010) and evidence of satisfactory workplace-based assessments will provide the framework for graded responsibility and will be used as evidence of satisfactory progress.

Evidence of competence and progression is reviewed annually in the ARCP process

Model of Learning

The models of learning can be applied to any stage of training in varying degrees. The majority of the curriculum will be delivered through work-based experiential learning, but the environment within the department should encourage independent self-directed learning and make opportunities for relevant off-the-job education by making provision for attendance at local, national and appropriate international meetings and courses. Independent self-directed learning should be encouraged by providing reference text books. It is the trainee's responsibility to seek opportunity for experiential learning. The rotas should also be arranged in such a way that SpRs have time available for participation in research projects as part of their training. The more academically inclined trainees may be encouraged to take time out from the training time to include a more sustained period of grant-funded research, working towards a higher academic degree such as a PhD.
Learning for knowledge, competence, performance and independent action will be achieved by assessment and graded responsibility for reporting, allowing trainees at various stages of training to acquire responsibility for independent reporting.

Progress of trainees, workplace-based assessments, the ARCP process and award of the CCST are the responsibility of the Postgraduate Dean and are monitored by the SAC in the Additional Dental Specialties following the guidelines of the Specialist Dental Education Board (SDEB) of the GDC. The First FRCR and DDR examinations are set and quality assured by The Royal College of Radiologists.

Teaching and Learning Methods

The following learning and teaching methods may be used to identify how individual objectives will be achieved.

a) **Supervised experiential learning (**Routine work**):** The most important learning experience will be the day-to-day work of diagnostic radiology, providing continuous work-place experiential learning. Dental and Maxillofacial Radiology is a consultant-led specialty and trainees are amongst the most closely supervised groups in postgraduate medical training. This close supervision allows frequent short episodes of teaching, which may hardly be recognised as such by trainees.

b) **Textbooks:** Departments should have a wide range of reference texts available. These allow trainees to 'read around' routine cases that they are reporting.

c) **Private study:** More systematic reading of textbooks and journals will be required in preparation for examinations.

d) **'Interesting cases' and other departmental teaching sessions:** These occur on a regular basis in most departments.

e) **Regional training courses:** These are valuable learning opportunities. Trainees should be released from service duties to attend.

f) **National training courses:** These are particularly helpful during preparation for the First FRCR examination. In addition to providing specific teaching, they also allow trainees to identify their position in relation to the curriculum and their medical radiology peers.

g) **Scientific meetings:** Research and the understanding of research are essential to the practice of diagnostic radiology. Trainees should be encouraged to attend and present their work at relevant meetings – both Dental and Maxillofacial as well as Head and Neck Radiology.

h) **Discussion with biomedical scientists (BMS):** BMS staff can provide excellent training, particularly in relation to radiation physics, radiation protection, health and safety, service delivery, procurement and human resources.

i) **Multidisciplinary team meetings (MDTs):** Attendance at and contribution to MDTs and clinicopathological conferences offers the opportunity for trainees to develop an understanding of clinical management and appreciate the impact of radiological and histopathological diagnosis on patient care. The MDT is also an important arena for the development of interprofessional communication skills.

j) **Attachment to specialist departments:** Attachments of this kind will be required if a training programme cannot offer the full range of specialist experience needed to complete the curriculum. They will also be beneficial for those trainees in their final year of training who wish to develop a special interest before taking up a consultant post.

The main teaching and learning methods appropriate to each domain are given in the following tables. This is not intended to be prescriptive or exhaustive. It is expected that all areas may be supplemented with independent study and that trainees will participate in a range of local, regional and national courses as well as attendance at relevant conferences.

Supervision and Feedback

Supervision has more than one meaning in Radiology. During the four years of specialist training, trainees will be supervised by departmental consultants on a day-to-day basis under the direction of a designated educational supervisor, the training programme director and the Specialist Training Committee which links to the appropriate Postgraduate Deanery.

Trainees will work under consultant supervision in the dental and maxillofacial radiology service, gradually widening their knowledge and experience in each area so that by the time they have passed the DDR Part B examination they are able to work largely independently. The day-to-day supervised training will be supplemented by more formal teaching such as departmental tutorials and 'interesting cases' sessions and on regionally and nationally organised training courses (see above).
If a radiology report generated by the trainee states that they have been supervised by a consultant, this is usually taken to mean that the consultant has examined that report with the trainee. It also implies that the consultant accepts the radiological interpretation as accurate, even if the supervisor has not personally viewed the images.

However, there is also a more general level of supervision in day-to-day work. A trainee may ask for assistance at any time if a radiological image with which they are dealing reveals anything unfamiliar or unusual. Supervision also extends to working relationships and communication within and beyond the dental radiology department.

The close relationship between consultants and trainees in dental and maxillofacial radiology ensures appropriate educational support as well as patient and trainee safety. This is supplemented by regular appraisal by the educational supervisor, regular assessments by educational and clinical supervisors and the Annual Review of Competence Progression (ARCP), under the auspices of the Postgraduate Dean.

In the *Dental Gold Guide*, RITA forms have been replaced by the Annual Review of Competence Progression (ARCP) which is based on the more explicit use of evidence to inform the annual assessment of progress. The Royal College of Radiologists anticipates implementation of ARCPs in August 2010.

Managing Curriculum Implementation

The curriculum outlines the minimum training requirements for delivery in a regional training programme. It guides trainers in the teaching methods required to deliver the curriculum and guides trainees in the learning and assessment methods required for satisfactory completion of training.

It is the responsibility of the Programme Director and deanery, with the assistance of the Specialty Training Committee (STC), to ensure that the programme delivers the depth and breadth of dental and maxillofacial radiology training, including relevant aspects of Head and Neck radiology, outlined in the curriculum. The Programme Director must ensure that each post or attachment within the programme is approved by the relevant deanery and SAC.

It is the responsibility of the GDC to quality assure specialist training and listing nationally. It is the responsibility of the SAC with guidance from The Royal College of Radiologists to ensure training programmes across the UK are able to deliver a balanced programme of training.

It is the responsibility of the educational supervisor of a particular post or attachment within a programme to ensure that the training delivered in their post meets the requirements of the relevant section(s) of the curriculum. They must undertake regular appraisal with their trainee to ensure structured and goal-oriented delivery of training.

Trainees must register with the SAC on appointment to a Dental and Maxillofacial Radiology training programme. They must familiarise themselves with the curriculum and with the minimum training requirements to satisfactorily complete each stage of training and the award of the CCST. They must also be familiar with the requirements of the Royal College of Radiologists' First FRCR(Physics) and DDR examinations and must make appropriate use of the logbook and portfolio.

Curriculum Review and Updating

The curriculum will be evaluated and monitored by the SAC as part of continuous feedback from STCs, Programme Directors, trainers, trainees and appropriate lay representation.

EQUALITY AND DIVERSITY

The Royal College of Radiologists will comply, and ensure compliance, with the requirements of equality and diversity legislation, such as:

- 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.

The Royal College of Radiologists believes that equality of opportunity is fundamental to the many and varied ways in which individuals become involved with the College, either as members of staff and Officers, as advisers from the medical and dental profession, as members of the College's professional bodies or as doctors or dentists in training and examination candidates. Accordingly it warmly welcomes contributors and applicants from as diverse a background as possible and actively seeks to recruit people to all its activities regardless of race, religion, ethnic origin, disability, age, gender or sexual orientation.

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The Curriculum

Competency expected for the award of a CCST in Dental and Maxillofacial Radiology

The level of competency overall must be sufficient so that on completion of training, the Dental and Maxillofacial Radiologist must be capable of providing an independent diagnostic service at the level required for the award of a CCST in the specialty, be able to offer a specialist opinion on referred cases and be able to provide specialist advice to clinicians with direct responsibility for the treatment of patients.

Because of differences in the structure of training programmes, case mix between centres and special interests of trainers and/or of trainees, some variation in 'hands-on' interventional skills experience in the different fields of dental and maxillofacial radiology, including relevant aspects of head and neck radiology, is to be expected. These additional/optional practical interventional procedures are designated in Appendix 3 at the end of the 'Maxillofacial Radiology' section of the Curriculum. However, for the award of a CCST trainees are expected to have satisfactorily completed all theoretical aspects and practical procedures included within the Curriculum which has been divided into 4 sections:

Section 1 – Generic knowledge and skills

Section 2 – Physics and Radiation Protection

Section 3 – Dental Radiology (Basic – examined in DDR Part A, and Advanced – examined in DDR Part B)

Section 4 – Maxillofacial Radiology including relevant aspects of head and neck radiology

SECTION 1. Generic knowledge and skills

1 GOOD CLINICAL CARE – Time management and Decision making

Teaching Objectives: to enable trainees to prioritise and organise radiological and clerical duties in order to optimise patient care and to make appropriate radiological and clerical decisions in order to optimise the effectiveness of the radiological team resources.

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Good clinical care	Recognise that organisation is key to time management Recognise that some tasks are more urgent and more important than others Recognise that some tasks may have to wait or be delegated to others Outline techniques for improving time management Recognise the clinical priorities for investigation and management	Identify radiological and clerical tasks requiring attention or predicted to arise Estimate the time likely to be required for essential tasks and plan accordingly Group together tasks to work effectively Communicate changes in priority to others Recognise the most urgent/important tasks and ensure that they are managed expediently Regularly review and re-prioritise personal and team work load Analyse and manage clinical problems effectively Recognise when you or others are falling behind and take steps to rectify the situation	Be flexible and willing to change in the light of changing conditions Remain calm in stressful or high pressure situations and adopt a timely, rational approach Be willing to ask for help	Observation of peers and senior staff Individual tuition by radiologists	Rad-DOPS MSF

2 MAINTAINING GOOD CLINICAL PRACTICE (Lifelong learning, Overall clinical judgement and Evidence based practice)

Teaching Objectives: to enable trainees to recognise the need for continued learning as a fundamental component of medical practice, to recognise the fundamental importance of integration of clinical information together with radiological features and to employ an evidence based approach in the practice of radiology.

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Overall clinical judgement	Describe clinical and acquired radiological information to allow integration of clinical data and radiological features	Accurately interpret radiological features in the context of available clinical information	Responsible for personal life-long continuing clinical and radiological professional development and monitoring own performance	Observation of peers and senior staff Individual tuition by a radiologist Supervised experiential learning	Mini-IPX Rad-DOPs MSF DDR Part B
Professional approach and recognition of own limitations	Recognise and describe the importance of professionalism, punctuality and reliability	Organise tasks effectively, use initiative and to be punctual and reliable Behave and present oneself in a professional manner at all times	Consult and admit mistakes willingly Recognise one's own limitations and know when to ask for advice Show courtesy towards medical secretaries and clerical staff	Observation of peers and senior staff Individual tuition by a radiologist Supervised experiential learning	Min-IPX Rad-DOPs MSF DDR Part B

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Written records	Explain the relevance of data protection pertaining to patient confidentiality	Produce concise and accurate reports with appropriate content and clear conclusions and other written correspondence tailored to the referrer Utilize electronic notes and record information electronically Recognise the problems faced by people for whom English is not a first language	Implement willingly timely dictation, cost-effective use of medical secretaries and the use of electronic communication Recognise the need for prompt and accurate communication with clinicians	Observation of peers and senior staff Observation of processes in dental and general radiology departments and offices Individual tuition by radiologists, and office staff Supervised experiential learning	Mini-IPX Rad-DOPs MSF DDR Part B
Decision making	Describe clinical priorities for investigation and management	Interpret and manage clinical problems effectively	Be flexible and willing to change in the light of changing conditions Be willing to ask for help	Observation of peers and staff Individual tuition by radiologists, and clinicians Attendance and presentations at MDTs and clinical meetings Supervised experiential learning	Mini-IPX Rad-DOPS MSF DDR Part B

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Life-long learning	Recognise the importance of continuing professional development	Use learning opportunities to keep up-to-date Maintain a professional portfolio Monitor own performance through audit and feedback Ensure compliance with the GDC requirements for CPD, recertification and revalidation	Be self-motivated and eager to learn Show willingness to learn from colleagues and to accept constructive feedback	Observation of peers and staff Individual tuition by mentors and trainers Independent study	Educational supervisor report PDP/Appraisal
Information technology	Describe modern communication, search strategies, data storage and security Recognise the principles of how to retrieve and utilise data recorded in clinical systems Recognise the principles of videoconferencing and teleradiology	Use databases, word processing and statistics programmes appropriately Undertake searches and access websites and health-related databases Apply the principles of confidentiality in the context of information technology Use digital imaging devices effectively Use videoconferencing and teleradiology equipment when necessary	Adopt a proactive and enquiring attitude to and engage with new and established information technology relevant to clinical practice Be prepared to use video-conferencing and teleradiology systems when appropriate	Individual tuition by appropriate staff Local and national courses Independent study Supervised experiential learning	Mini-IPX Rad-DOPS MSF DDR examinations

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
The organisational framework for clinical governance and its application in practice	Explain clinical governance and describe the benefits that a patient might reasonably expect from clinical governance	Actively participate in clinical governance and audit Practise evidence-based medicine Report critical incidents Take appropriate action regarding concerns on fitness to practise Handle and deal with complaints in a focused, sympathetic and constructive manner	Make patient care the first concern Respect patients' privacy, dignity and confidentiality Learn from mistakes, errors and complaints Aim for clinical effectiveness (best practice) at all times Work willingly within a team Share best practice with others	Individual tuition by appropriate staff Local and national courses Independent study Supervised experiential learning	Audit assessment tool Attendance and participation at relevant meetings MSF
Risk Management	Explain heath and safety policy, policies on needle stick injuries, note keeping, communication and staffing numbers Describe risk management issues pertinent to an imaging department Describe the risks, side effects & complications of contrast media and imaging investigations and treatments	Apply procedures in practical situations Discuss relevant radiation risks and benefits with patients and obtain informed consent Manage adverse contrast media reactions	Be truthful and admit error Respect individual patient choice	Individual tuition by appropriate staff Local and national courses Supervised experiential learning	Rad-DOPS MSF First FRCR and DDR Part A examinations

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Evidence	Define the principles of evidence-based medicine and dentistry Appreciate the role of guidelines	Critically appraise published clinical and research evidence Utilise guidelines Contribute to the development of guidelines	Respect individual patient choice Be truthful and admit error	Individual tuition by appropriate staff Local and national courses Preparation and presentation of talks (eg journal clubs)	Audit assessment tool Mini-IPX Rad-DOPS DDR Part B
Audit (general)	Explain the audit cycle, data sources and data confidentiality Recognise the principles of internal and external quality assurance	Initiate and complete an audit project	Accept the relevance of audit to benefit patient care and individual performance (i.e. to clinical governance)	Individual tuition by appropriate staff Local and national courses Undertake and report audit projects	Audit assessment tool MSF DDR examinations
Guidelines	Explain the advantages and disadvantages of guidelines and Selection Criteria	Utilise guidelines Contribute to the development of guidelines	Apply guidelines and Selection Criteria willingly as appropriate to the individual	Individual tuition by appropriate staff Local and national courses Supervised experiential learning	Rad-DOPS MSF DDR examinations

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Patient safety	Explain the issues around patient safety and the role of the National Patient Safety Agency (NPSA) Recognise the NPSA National Reporting and Learning System	Ensure patient safety in a practical situation	Show regard for patient safety	Individual tuition by appropriate staff Local and national courses Supervised experiential learning	Rad-DOPS MSF

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Structure of the NHS and the principles of management including equality and diversity	Explain the structure of the NHS, and of local Trust's management (including management of radiology departments) Describe the equality and diversity framework Describe the role of postgraduate deaneries, specialist societies, the Faculties of Dental Surgery of the Surgical Royal Colleges, the Royal College of Radiologists and the General Dental Council Describe the role of central government health agencies Describe the importance of a health service for the population	Demonstrate good time management and prioritisation skills Communicate with patients and colleagues from diverse backgrounds Practice in accordance with guidance on equality and diversity	Show respect for others, ensuring equal opportunities Respect diversity within clinical practice Demonstrate a clear understanding of the importance of good time management and the ability to prioritise tasks Take opportunities to become involved in management activities Recognise the importance of good clinical management	Individual tuition by appropriate staff Local and national management courses Supervised experiential learning Attendance at appropriate meetings	MSF DDR examinations Reflection Completion of recognised equality and diversity training

3 TEACHING AND TRAINING, APPRAISING AND ASSESSING

Teaching Objectives: to enable trainees to recognise the fundamental importance of understanding the value of teaching and training in clinical practice and to develop strategies for delivering education and assessment in a wide variety of formal and informal settings.

Subject	Knowledge	Skills	Attitude	Teaching and Learning methods	Assessment methods
To have the skills, attitudes and practices of a competent teacher	Recognise the multifaceted nature of knowledge as it relates to dental practice Recognise the importance of a positive, constructive approach to mentoring and educational supervision Recognise the range of different adult learning principles Identify learning styles	Teach using a variety of methods and stimuli to suit different subjects and situations Effectively present information in a variety of ways Provide effective feedback and help develop reflective practice Conduct effective appraisal Promote patient education Undertake and deliver workplace-based assessment Construct educational objectives Use appropriate questioning techniques	Demonstrate a positive approach to both giving and receiving mentoring and educational supervision Promote and encourage a constructive knowledge-sharing environment Balance the need of educational demands with service delivery Participate willingly in giving formal tuition in radiological/dental education Recognise the importance of personal development as a teacher in relation to aspects of good professional behaviour Promote and encourage a constructive knowledge-sharing environment	Individual tuition by appropriate staff Observation of peers and staff Local and national courses Supervised experiential learning	Rad -DOPS MSF Teaching observation tool

Subject	Knowledge	Skills	Attitudes	Teaching and Learning methods	Assessment methods
To be able to plan and analyse a research project	Describe the principles of performing a research study Recognise the principles of research ethics and the structure and function of local research ethics committees Recognise the principles of research funding and how to obtain it	Undertake systematic critical review of scientific literature Have good written and verbal presentation skills Initiate, complete and publish/present a research project Demonstrate the use of appropriate statistical methods	Demonstrate curiosity and a critical spirit of enquiry Ensure patient confidentiality Recognise the importance of ethical approval and patient consent for clinical research	Individual tuition by appropriate staff Supervised experiential learning Preparation and presentation of research projects	MSF (assessment by supervisor if undertaking PhD)
Appraisal and assessment	Recognise the structure and differences between appraisal and assessment	Maintain an appraisal portfolio Undertake an effective appraisal or assessment	Demonstrate a positive attitude to appraisal Recognise equality and diversity issues as they relate to appraisal Maintain honesty and objectivity during appraisal and assessment	Undertaking appraisal and assessment Individual tuition by appropriate staff Observation of peers and staff	Rad-DOPS MSF

4 RELATIONSHIPS WITH PATIENTS

Teaching Objectives: to enable trainees to maintain good professional relationships with all patients and to conduct professional interactions with vulnerable adults, children and their carers according to legislation.

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Continuity of care	Recognise the importance and relevance of continuity of care	Ensure satisfactory completion of reasonable tasks Make adequate arrangements to cover leave	Recognise the importance of punctuality and attention to detail	Individual tuition by appropriate staff Independent study Local and national courses Supervised experiential learning	MSF
Recognise own limitations	Recognise one's own limitations and know when to ask for advice	Demonstrate insight of personal strengths and weaknesses	Honest and truthful and responsive to advice and constructive criticism Willing to consult, seek advice and to admit mistakes		Rad -DOPS MSF

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Relevance of outside bodies	Describe the relevance to professional life of: • Royal Colleges of Surgeons • GDC • Postgraduate Dean • Royal College of Radiologists • Defence unions • BDA • Specialist societies	Recognise situations when appropriate to involve these bodies and individuals	Be open to constructive criticism Accept professional regulation	Individual tuition by appropriate staff Independent study Local and national courses Supervised experiential learning	MSF Reflection
Informed consent	Describe the processes for gaining informed consent Explain the principles of consent issues as relating to clinical practice and research	Apply the processes for gaining informed consent	Respect for patients' and relatives' points of view and wishes		Rad-DOPS MSF DDR examinations
Confidentiality	Describe situations when confidentiality might be broken.	Demonstrate the relevant strategies to ensure confidentiality Use and share information appropriately	Respect the right to confidentiality		Rad-DOPS MSF DDR examinations
Legal issues	Explain legal issues relating to radiological reporting	Apply legal issues to radiological practice Work within the UK legal framework for radiology	Act with compassion at all times		Rad-DOPS MSF

5. WORKING WITH COLLEAGUES

Teaching Objectives: to enable trainees to develop and demonstrate good working relationships with colleagues and other health care professionals, to acquire and develop appropriate and effective inter-personal skills which will enable the individual to bring out the best in colleagues, to resolve conflicts, to develop working relationships within the team and to support team development that bring together different professions, disciplines and other agencies to provide high quality care.

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Clinical teams	Describe how a team works effectively Describe the roles and responsibilities of team members within the department and within multidisciplinary teams Recognise the roles of other clinical specialties and their limitations	Communicate effectively Seek advice if unsure Recognise when to delegate Show leadership and supervise safely	Show respect for others' opinions. Be conscientious and work co-operatively Recognise willingly own limitations Provide supervision to less experienced colleagues	Individual tuition by appropriate staff Supervised experiential learning Attendance at MDT and appropriate meetings	MSF Teaching observation tool
Communication with colleagues	Describe the principles of good communication and conflict resolution techniques Describe local procedures and polices for expressing valid concerns about performance of any colleague (risk management)	Use appropriate language Communicate appropriately Reduce or eliminate tension in a difficult situation	Participate willingly in MDMs Treat colleagues fairly Be prepared to question colleagues' opinion in the interest of patient care	Supervised experiential learning	Rad-DOPS Mini-IPX MSF

Complaints	Define local and independent complaints procedures	Anticipate potential problems Manage dissatisfied colleagues	Act promptly with honesty and sensitivity Accept responsibility for one's actions	Observation of peers and staff Supervised experiential learning	MSF

6. HEALTH

Teaching Objective: to enable trainees understand the importance of the personal health of the dentist and his/her colleagues.

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Personal health	Explain the role of occupational health services Explain one's responsibilities to the public.	Recognise when personal health takes priority over work pressures and to be able to take the necessary time off	Recognise personal health as an important issue	Supervised experiential learning	MSF Appraisal
Stress	Describe the effects of stress Explain the support facilities for doctors and dentists	Develop appropriate coping mechanisms for stress and ability to seek help if appropriate	Recognise the manifestations of stress on self and others	Supervised experiential learning	MSF Appraisal

7. PROBITY

Teaching Objective: to enable trainees to be able to demonstrate probity in all aspects of professional practice.

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Service information	Describe legal framework for advertisements		Recognise absolute importance of accuracy and impartiality	Supervised experiential learning Independent study Preparation of relevant paperwork and applications	MSF DDR Examinations
Writing reports and giving evidence	Describe processes and procedures for generation of reports Describe legal responsibilities in writing and presenting reports	Communicate and write reports appropriately	Act with honesty, integrity and in a timely fashion		MSF DDR Examinations
Research	Describe research governance framework of the NHS and employing institution	Obtain ethical and institutional approval	Put safety and care of patients first. Conduct research with honesty and integrity		MSF DDR Examinations
Financial dealings	Describe the financial rules of employing institution Describe the principles of financial planning and preparation of a business case	Use financial reports and spreadsheets appropriately	Not induce patients to accept private medical care Manage funds for their intended purpose Declare conflicts of interest		MSF Appraisal

SECTION 2. Radiation Physics and Radiation Protection

Teaching Objective: to enable the trainee to acquire basic theoretical understanding of radiation physics and radiation safety including the current ionising radiation regulations and statutory obligations related to ionising radiation.

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Radiation physics and radiation protection	Describe the nature, structure & properties of matter, radioactivity, magnetism, ionising radiation, radiofrequency radiation and ultrasound and how they interact with matter Explain the physical principles underpinning: Radiography Fluoroscopy CT CBCT MRI Ultrasound Radionuclide imaging	Demonstrate appropriate use and operation of medical and dental imaging equipment Optimise radiation dose in radiographic and radionuclide imaging and: -select the most appropriate modality for a particular clinical scenario -select optimal operating factors Advise patients/ colleagues on different imaging modalities	Apply/adhere to the principles of justification, optimisation and limitation	Attendance at First FRCR physics course Individual tuition by physicists and radiologists Independent study Supervised experiential learning	First FRCR Physics module examination

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Radiation physics and radiation protection	Describe the construction, function and operation of medical and dental imaging equipment Explain the operating factors of imaging equipment, effects on indices of image quality and their inter-relationships Explain the principles of quality assurance in medical and dental imaging Describe image artefacts in medical and dental imaging Describe the hazards and risks to patients, staff and public from medical imaging Describe contrast agent, their reactions and adverse reactions Describe UK legislation and guidance in medical and dental imaging	Interpret images, communicate the results and discuss the complete imaging process with professional colleagues Demonstrate ability to reduce risk from all medical imaging modalities Recognise and manage adverse reactions to contrast media Implement UK legislation and guidance		Attendance at First FRCR physics course Individual tuition by physicists and radiologists Local courses on medical emergencies and CPR Independent study Supervised experiential learning	First FRCR Physics module examination Certification for medical emergencies and CPR

SECTION 3. Dental Radiology

1. Basic Dental Radiology training

Teaching Objective: to enable the trainee to acquire basic clinical, anatomical, pathological and radiological understanding of dento-alveolar disease with reference to common presentations and diagnoses (Appendix 1).

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Basic Dental Radiology	Describe applied anatomy of the jaws, the teeth, their supporting structures relevant to dento-alveolar disease & radiological diagnosis Describe terminology relevant to dento-alveolar imaging Describe the role & details of intra-oral and extra-oral imaging modalities including CBCT in dento-alveolar imaging Explain the principles of differential diagnosis of dento-alveolar bone lesions	Link presentations with likely diagnoses Determine optimal dento-alveolar imaging examinations Perform all intra-oral and extra-oral dentoalveolar radiographic techniques Interpret and report plain intra-oral and extra-oral dento-alveolar radiographic images and describe their limitations Accurately report non-complex cases	Apply/adhere to local regional guidelines Prioritise workload to respond to most urgent cases first Communicate results rapidly Involve seniors appropriately Tailor examination to clinical indication Attend case discussions	Observation of techniques in dental radiology department Independent study Individual tuition by dental radiologists Supervised experiential learning	DDR Part A Mini-IPX Rad-DOPS

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Basic Dental Radiology	Describe normal and variant anatomy relevant to dento-alveolar imaging Describe local/regional/ national guidelines in dento-alveolar investigations	Select imaging protocols, interpret and report dento-alveolar CBCT images Decide on initial patient radiographic management		Observation of techniques in dental radiology department Independent study Individual tuition by dental radiologists Supervised experiential learning	DDR Part A Mini-IPX Rad-DOPS

2. Advanced Dental Radiology training

Teaching Objective: to enable trainees to acquire detailed clinical, anatomical, pathological and radiological understanding of dento-alveolar disease with reference to the full range of presentations and diagnoses (Appendix 1).

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Advanced Dental Radiology	Recognise typical and atypical presentations and appearances of common conditions Recognise how diagnosis affects the management pathway Describe national/ international guidelines and current literature on dento-alveolar investigations	Work with minimum supervision with non-complex cases Recognise atypical appearances of common conditions Recognise clinical priority of dento-alveolar presentations Recognise range of appearances which advance diagnosis Initiate additional examinations as appropriate Formulate appropriate treatment plans	Communicate results rapidly Respect senior/ specialist colleagues Seek additional clinical information relevant to case Participate in case discussions Highly organised work pattern	Observation of techniques in dental radiology department Independent study Individual tuition by dental radiologists Supervised experiential learning	DDR Part B Mini-IPX Rad-DOPS

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Advanced Dental Radiology	Recognise most acute clinical presentations and diagnoses Recognise uncommon conditions mimicking common diagnoses Explain the technical aspects of advanced dento-alveolar imaging techniques Describe the principles and processes of research	Lead dento-alveolar MDM Interpret complex dento-alveolar CBCT Establish clinical problem quickly and provide expert opinion on appropriate imaging Provide expert dento-alveolar image interpretation Accurately report complex cases Relate clinical and imaging findings succinctly Design and undertake research relevant to dento-alveolar imaging Write clear succinct reports which emphasise the key findings and diagnoses	Discuss complex cases with referring clinicians Assume leadership role in dento-alveolar meetings Offer timely specialist opinion	Observation of techniques in dental radiology department Independent study Individual tuition by dental radiologists Supervised experiential learning	DDR Part B Mini-IPX Rad-DOPS

SECTION 4. Maxillofacial Radiology

Teaching Objective: to enable trainees to acquire clinical, anatomical, pathological and radiological understanding of maxillo-facial disease, including relevant aspects of head and neck radiology, with reference to the full range of presentations and diagnoses (Appendix 2).

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Maxillofacial Radiology	Describe applied anatomy of maxillofacial skeleton including TMJ relevant to maxillofacial disease and radiological diagnosis Describe applied head and neck anatomy relevant to maxillofacial radiology including para-nasal sinuses, the anatomy of the skull base, cranial nerves (V,VII, IX, X and XII) and the temporal bone relevant to maxillofacial disease and radiological diagnosis	Determine optimal maxillofacial imaging examinations Decide on initial patient management Interpret and report plain intra-oral and extra-oral maxillofacial radiographs and describe their limitations Perform all intra-oral and extra-oral maxillofacial radiographic techniques Link presentations with likely diagnoses	Apply/adhere to local regional guidelines Prioritise workload to respond to most urgent cases first Communicate results rapidly Involve seniors appropriately Tailor examinations to clinical indication Attend and participate in MDTs	Observation of techniques in dental and general (Head & Neck) radiology departments Independent study Individual tuition by dental and general radiologists Supervised experiential learning	DDR Part B Mini-IPX Rad-DOPS

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Maxillofacial Radiology	Describe applied anatomy of the salivary glands, thyroid gland, cervical lymph nodes and soft tissue spaces of the neck relevant to maxillofacial disease and radiological diagnosis Describe normal and variant anatomy relevant to maxillofacial imaging Describe terminology relevant to maxillofacial imaging Describe the role and details of intra-oral and extra-oral dental imaging modalities in maxillofacial imaging including maxillofacial CBCT	Interpret and report maxillofacial CBCT examinations and describe their limitations Perform and interpret wide range of salivary gland investigations Perform and interpret wide range of neck and maxillofacial ultrasound Interpret and report maxillofacial CT and MRI Identify atypical appearances of common maxillofacial conditions (inc.the TMJ) on plain film, contrast studies, CBCT, CT and MRI Recognise the range of appearances of maxillofacial diseases	Respect senior/ specialist colleagues Seek additional relevant clinical information Initiate additional examinations as appropriate Develop highly organised work patterns Discuss complex cases with referring clinicians and colleagues	Observation of techniques in dental and general (Head & Neck) radiology departments Independent study Individual tuition by dental and general radiologists Supervised experiential learning	DDR Part B Mini-IPX Rad-DOPS

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Maxillofacial Radiology	Describe the role and details of CT, MRI and ultrasound imaging in maxillofacial radiology including the salivary glands Describe the role and details of TMJ investigations Describe the role and details of radionuclide investigations in the maxillofacial region Explain the principles of differential diagnosis of maxillofacial bone lesions and soft tissue conditions involving the maxillo-facial region Describe tumour staging	Work with minimum supervision with non-complex cases Establish clinical problems quickly and relate clinical and imaging findings succinctly Provide expert opinion on appropriate patient imaging	Offer timely specialist opinion Collaborate with allied health professionals in multidisciplinary teams and report complex investigations	Observation of techniques in dental and general (Head & Neck) radiology departments Independent study Individual tuition by dental and general radiologists Supervised experiential learning	DDR Part B Mini-IPX Rad-DOPS

Subject	Knowledge	Skills	Attitudes	Teaching and Learning methods	Assessment methods
Maxillofacial Radiology	Recognise typical and atypical presentations of the full range of maxillofacial conditions Recognise most acute clinical presentations and diagnoses Recognise uncommon conditions mimicking common diagnoses Describe local/regional/ national/international guidelines and current literature on maxillofacial investigations	Provide expert maxillofacial image interpretation Write clear, accurate and succinct reports which emphasise the key findings and diagnoses		Observation of techniques in dental and general (Head & Neck) radiology departments Independent study Individual tuition by dental and general radiologists Supervised experiential learning	DDR Part B Mini-IPX Rad-DOPS

Subject	Knowledge	Skills	Attitudes	Teaching and learning methods	Assessment methods
Maxillofacial Radiology – 'hands-on' and interventional procedures (See page 16)		Perform diagnostic sialography Perform diagnostic ultrasound Perform US guided fine needle aspiration		Observation of techniques in dental and general (Head & Neck) radiology departments Independent study Individual tuition by dental and general radiologists Supervised experiential learning	DDR Part B Mini-IPX Rad-DOPS

Appendix 1 – Dental (dento-alveolar) Radiology Presentations and Diagnoses

Dental (dento-alveolar) Radiology	
Presentations	**Diagnoses**
• Pain – toothache, dento-alveolar • Acute injury and trauma • Tooth mobility • Non-eruption of teeth • Dento-alveolar infection • Dento-alveolar bone swelling/mass • Premature loss of teeth • Unexplained dento-alveolar bleeding • Incidental finding	Caries • Primary • Secondary/Failed restoration Resorption • Internal • External Infection • Periapical • Periodontal • Pericoronal • Alveolar bone Developmental anomalies • Number • Structure • Size • Shape • Position Trauma • Tooth fractures, subluxation, intrusion and extrusion • Dento-alveolar fractures • Dento-alveolar bone diseases • Fibro-cemento-osseous lesions

Appendix 2 – Maxillofacial Radiology Presentations and Diagnoses

Maxillofacial Radiology	
Presentations	**Diagnoses**
• TMJ pain • Acute injury • Intra-oral/extra-oral soft tissue mass • Dry mouth/salivary gland obstruction • Salivary gland swelling • Maxillofacial infection • Maxillary sinus pain • Maxillofacial bony and soft tissue masses • Neck/cervical and thyroid masses • Lymph nodes • Maxillofacial developmental and syndromic abnormalities • Pre-implant assessment • Orthodontic assessment and changes to the occlusion	Trauma • Mandibular and middle third facial fractures • TMJ injury and dislocation • Soft tissue injuries Infection • Maxillofacial bone • TMJ • Intra-oral/extra-oral soft tissue and soft tissue spaces • Salivary glands • Para-nasal sinuses • Lymph nodes Cysts • Odontogenic • Non-odontogenic • Developmental neck cysts Tumours/tumour like lesions (benign/malignant) • Odontogenic • Bone including TMJ: 1^0 and 2^0 • Soft tissue including salivary and thyroid glands • Lymph nodes – 1^0 and metastases • Aerodigestive tract: 1^0 and 2^0

• Cranial nerve (V, VII, IX, X and XII) anomalies • Incidental finding	Haematological/vascular • Haemoglobinopathies • Hamartoma/haemangioma • AV malformations Metabolic and endocrine disorders • Rickets • Osteomalacia • Hyperparathyroidism • Osteoporosis TMJ disease/Arthropathies • Degenerative • Inflammatory • Internal derangement Salivary gland disease • Obstruction • Sjogren's syndrome • Sialadentitis • Sialosis Congenital, developmental and paediatric anomalies • Mandible and maxilla including cleft palate • Orthodontics • Para-nasal sinuses • Salivary glands Bone volume • Height, width, thickness for implant placement

	Miscellaneous/bone-related lesions • Paget's disease of bone • Osteonecrosis • Osteopetrosis • Giant cell lesions • Osseous dysplasias

Appendix 3 – Maxillofacial Radiology – Additional Optional Procedures and Interventional Skills

- Salivary stone retrieval
- Salivary ductoplasty
- Video-fluoroscopic swallows
- Dacryocystography
- Thyroid ultrasound
- Ultrasound guided core biopsy