

BRITISH SOCIETY OF DENTAL AND MAXILLOFACIAL RADIOLOGY



CORE CURRICULA IN DENTAL RADIOGRAPHY AND RADIOLOGY FOR THE DENTAL TEAM

2020

INTRODUCTION

The original core curriculum in Dental Radiography and Radiology for undergraduate dental students was approved by the Council of the British Society of Dental and Maxillofacial Radiology (BSDMFR) in October 1993. It received wide circulation following inclusion as Appendix C of *Guidelines for Radiology Standards for Primary Dental Care*¹. This curriculum was subsequently updated in 2002, 2008 and 2015. In addition, a separate curriculum for Dental Care Professionals was approved in 2008.

The 2015 version of this document brought together the 2008 curriculum for dental students and the 2008 curriculum for Dental Care Professionals undertaking radiography as IR(ME)R **operators**. This new 2020 version of this document is a modification of the 2015 document to reflect the updated Ionising Radiations Regulations 2017 (IRR 2017) and Ionising Radiation (Medical Exposure) Regulations 2017 (IR(ME)R 2017).

This new 2020 version and the 2015 version of this document acknowledges the GDC's decision to allow certain Dental Care Professionals, namely therapists and hygienists, to act as IR(ME)R **referrers**, IR(ME)R **practitioners** and also as IR(ME)R **operators** who can report radiographs. Prior to 2014, training programmes for these particular Dental Care Professionals had only included training to enable them to act as non-reporting IR(ME)R **operators**. This version also includes the curriculum for dental nurses acting as IR(ME)R **operators** but not undertaking radiography.

Regulation 17 paragraph 1 of the Ionising Radiation (Medical Exposure) Regulations 2017 (IRMER)³ states that a **practitioner** or **operator** must not carry out an exposure or any practical aspect without having been adequately trained. The requirements for adequate training are set out in Schedule 3 of the Regulations. The Schedule states that **practitioners** and **operators** must have completed training, including theoretical knowledge and practical experience in

- i) Radiation production, radiation protection and statutory obligations (Ionising Radiations Regulations 2017 (IRR 2017), Ionising Radiation (Medical Exposure) Regulations 2017 (IR(ME)R 2017) relating to ionising radiations, as are relevant to their functions as **practitioner** or **operator**; and
- ii) Diagnostic radiology as relevant to their specific area of practice.

This curricula guidance is intended to meet the requirements for adequate training in those subjects specified in Schedule 3 of IR(ME)R 2017.

GDC Requirements: The publication *Preparing for Practice - Dental team learning outcomes for registration*² was published in 2011 and implemented in 2012. These learning outcomes describe the outcomes an individual must be able to demonstrate by the end of their training in order to register with the General Dental Council (GDC) as a dental professional and member of the dental team. Delivering safe, effective and appropriate care to patients is the focus of developing a registrant's knowledge, competence and decision making skills in both 'Individual patient care' and 'Population based health and care'.

There are relatively few outcomes specific to dental radiography and radiology in the document, but those that do include:

Domain 1: Clinical Individual patient care

1.1.11 Explain and apply the scientific principle of medical ionising radiation and statutory regulations

1.2.4 Undertake relevant special investigations and diagnostic procedures, including radiography

1.2.6 Discuss the importance of each component of the patient assessment process.

1.4.1 Synthesise the full results of the patient assessment and make clinical judgements as appropriate

This document concentrates on the knowledge, skills, attitudes and behaviours required of registrants to deliver high quality clinical care to patients in the context of dental radiography and radiology. Quality of care relates to patient safety, clinical effectiveness and patient experience.

For each requirement in the curricula the level of knowledge required will be identified for each group of registrants as a competence, having knowledge, having recognition/awareness or not required .

KEY:

Competence	Knowledge (PG Training required to be competent)	Recognise/ Awareness but not detailed knowledge	Not Required
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Competence may be defined as

A level of performance demonstrating effective application of knowledge, skill and judgement.
Ability to perform a task to a defined level

Knowledge may be defined as

Familiarity awareness or understanding gained through experience or study that would not be sufficient to perform a specific task.

Recognise/ Awareness

Limited knowledge. Awareness that it is out of the scope of your practice and a second opinion or referral to specialist care is required

	Dental Team Member			
	Dentist	DCP (Referrer/Practitioner and reporting Operator)	DCP (Radiography trained non reporting operator)	Dental Nurse not undertaking dental radiography
Theoretical knowledge				
Radiation Physics as outlined Schedule 3 of IR(ME)R 2017	Competence	Competence	Competence	Knowledge
Radiation Protection as outlined Schedule 3 of IR(ME)R 2017	Competence	Competence	Competence	Knowledge
Statutory Obligations including : IRR 2017 & IR(ME)R 2017 relevant to dental radiography	Competence	Competence	Competence	Knowledge
Equipment: -The x-ray tube and components of the x-ray unit -The effect of mA/ kV/ exposure time on the quality and intensity of the x-ray beam -Collimation -Filtration	Competence	Competence	Competence	

	Dental Team Member			
	Dentist	DCP (Referrer/Practitioner and reporting Operator)	DCP (Radiography trained)	Dental Nurse not undertaking dental radiography
Image receptors & processing -Film types - Cassettes & intensifying screens -Chemical film processing -Digital sensors -Digital processing	Competence	Competence	Competence	Knowledge
Quality Assurance & Quality control -Image quality -Patient dose and Equipment -Film based processing & film faults -Digital systems including image faults, data storage, viewing and data protection -Procedures and local rules -Training -Audit	Competence	Competence	Competence	Knowledge
Justification/ selection criteria for radiographic exposure				
Bitewings and periapicals	Competence	Competence	Competence	
Occlusal views	Competence	Knowledge	Knowledge	
Dental panoramic tomography	Competence	Knowledge	Knowledge	
Oblique lateral views	Competence			
Lateral cephalometry	Knowledge	Knowledge		
Skull views	Knowledge			
Cone beam CT	Knowledge			
Radiographic techniques and practical instruction including special care and child patients				
Cross infection control within dental radiology	Competence	Competence	Competence	Competence

	Dental Team Member			
	Dentist	DCP (Referrer/Practitioner and reporting Operator)	DCP (Radiography trained)	Dental Nurse not undertaking dental radiography
Intraoral: Periapicals -Paralleling technique -Image receptor holders -Bisecting angle technique	Competence	Competence	Competence	
Periapicals for endodontics	Competence			
Intraoral: Bitewings	Competence	Competence	Competence	
Occlusal views: -Upper standard occlusal -Lower 45° occlusal -Lower 90° occlusal	Competence	Competence	Competence	
Oblique occlusal views	Knowledge	Knowledge	Knowledge	
Dental panoramic tomography	Competence	Competence	Competence	
Oblique lateral radiography	Knowledge	Knowledge	Knowledge	
Lateral cephalometry	Knowledge	Knowledge	Competence (orthodontic practices only)	
Plain image processing -Conventional chemical -Digital	Competence	Competence	Competence	Competence
Skull views	Knowledge			
Sialography	Recognise			
Cone beam CT	Recognise			
Conventional CT	Recognise			
MRI	Recognise			
Ultrasound	Recognise			
Nuclear medicine	Recognise			
Identification of normal radiological anatomy of the teeth and jaws as observed on specific images				
Periapicals and Bitewings	Competence	Competence	Knowledge	
Occlusal views	Competence	Knowledge	Knowledge	
Dental panoramic tomographs	Competence	Knowledge	Knowledge	

	Dental Team Member			
	Dentist	DCP (Referrer/Practitioner and reporting Operator)	DCP (Radiography trained)	Dental Nurse not undertaking dental radiography
Oblique lateral views	Knowledge	Knowledge		
Lateral cephalometric views	Recognise			
Skull views	Recognise			
Cone beam CT	Recognise			
Identification of the radiological features of disease observed on intra oral images				
Caries	Competence	Competence		
Periodontal disease	Competence	Competence		
Periapical disease	Competence	Competence		
Disease affecting floor of maxillary antrum	Competence	Competence		
Trauma affecting the teeth and supporting alveolar bone	Competence	Knowledge		
Benign radiolucencies of the jaws -Odontogenic -Non Odontogenic	Competence	Knowledge		
Opacities of the jaws -Odontogenic -Non odontogenic	Competence	Recognise		
Malignant lesions of the jaws	Competence	Knowledge		
Soft tissue opacities	Competence			
Abnormalities of the dentition	Competence	Knowledge		
Identification of the radiological features of disease observed on panoramics and oblique lateral views				
Caries	Competence	Competence		
Periodontal disease	Competence	Competence		
Disease affecting the maxillary antrum	Competence	Knowledge		
Trauma affecting the teeth and bone	Competence	Recognise		

	Dental Team Member			
	Dentist	DCP (Referrer/Practitioner and reporting Operator)	DCP (Radiography trained)	Dental Nurse not undertaking dental radiography
Benign radiolucencies of the jaws -Odontogenic -Non Odontogenic	Competence	Recognise		
Opacities of the jaws -Odontogenic -Non odontogenic	Competence	Recognise		
Malignant lesions of the jaws	Competence	Knowledge		
Soft tissue opacities	Competence	Recognise		
Abnormalities of the dentition	Competence	Knowledge		
Abnormalities of the TMJ	Competence	Recognise		
Identification of the radiological features of disease observed on skull images				
Trauma of the skull and Jaws	Knowledge			
Craniofacial abnormalities	Knowledge			
Reporting skills and referral				
Construction of a clear concise written report for periapical and bitewing radiographs	Competence	Competence		
Construction of a clear concise written report for dental panoramic radiographs	Competence			
Identification of patients with suspected cancer and fast track referral	Competence			
Construction of a written referral for; -a radiological opinion -out-patient specialist opinion -a dentist if a direct access DCP patient	Competence	Competence		

Teaching and time required

These courses could be covered using lectures, practical radiography and seminars and may be integrated into various teaching units. Other teaching styles may also be used such as technology enhanced learning and problem-based learning. The main objective of the different courses is that upon completion students/trainees should be competent to undertake dental radiography and radiology to a level and standard required in their area of general practice. It is suggested that a total of 80 hours is normally sufficient to cover the course for undergraduate dental students, and 40 hours for therapy/hygiene students, but this is not prescriptive since the number of hours taught is not as important as the quality of the teaching received.⁴

Examination

It is considered essential that these curricula are formally assessed within the examination structure of the individual dental training organisation, and that each major area is identifiable. This will ensure any certificate awarded is evidence of appropriate 'adequate training' for the different groups of students/trainees as required under IR(ME)R 2017³. If a student/trainee is to be deemed to need to be competent in specific areas of the curriculum e.g. Competent to undertake an intraoral radiograph, this competency should be assessed.

Tuition

The implementation of these curricula is dependent on the appointment of an adequate number of trained dental radiologists and radiographers (depending on the curriculum being taught) in the different teaching organisations.

REFERENCES

1. National Radiological Protection Board. Guidelines on Radiology Standards for primary dental care Report by the Royal College of Radiologists and the National Radiological Protection Board. Documents of the NRPB 1994:5:No 3.
2. General Dental Council. Preparing for practice - Dental team learning outcomes for registration. First edition London: General Dental Council 2011
3. Ionising Radiation (Medical Exposure) Regulations 2017. SI 2017 Number 1322 London: The Stationery Office 2017.
4. Rohlin M and Hirschmann PN. Designing an undergraduate curriculum in oral radiology is more than hours and content (Editorial). Dentomaxillofacial Radiol 1998; 27:1-2

Further reading:

1. National Radiological Protection Board/Department of Health. Guidance Notes for Dental Practitioners on the Safe Use of X-ray Equipment. Chilton: NRPB 2001.
(<https://www.gov.uk/government/publications/dental-practitioners-safe-use-of-x-ray-equipment>).

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- Mr Eric Whaites, Senior Lecturer & Honorary Consultant in Dental and Maxillofacial Radiologist, King's College London Dental Institute, Guy's & St Thomas' NHS Foundation Trust
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