

3. **GASTROINTESTINAL AND HEPATOBILIARY RADIOLOGY – ADVANCED/SPECIAL INTEREST TRAINING CURRICULUM**

3.1 **Introduction**

- 3.1.1 This curriculum outlines the special interest training requirements for specialty training in gastrointestinal and hepatobiliary (GI) radiology.
- 3.1.2 The content of the special interest of gastrointestinal radiology can be broadly defined as the study of the application, performance and interpretation of all imaging techniques/procedures relevant to the investigation and management of diseases of the gastrointestinal and hepatobiliary tract.
- 3.1.3 All trainees will have acquired a broad knowledge of gastrointestinal and hepatobiliary imaging during core training and will already have acquired the core skills.
- 3.1.4 The aim of special interest training in GI radiology is to enable the trainee to become clinically competent and to consistently interpret the results of gastrointestinal and hepatobiliary investigations accurately and reliably. Where appropriate, trainees will also be capable of providing a comprehensive and safe interventional diagnostic and therapeutic service.
- 3.1.5 The period spent in training will vary according to the needs of the trainee. For a person wishing to specialise primarily in GI radiology, the equivalent of 12 to 24 months substantially devoted to the subject is recommended (i.e. a minimum of 6 sessions per week dedicated to the special interest).
- 3.1.6 Those clinical radiologists who plan to practise GI radiology as one of a mixture of activities (albeit that gastrointestinal and hepatobiliary radiology will be a particular responsibility within those activities) will normally undertake around 6 to 12 months of special interest training in gastrointestinal and hepatobiliary radiology (with a minimum of 6 sessions per week dedicated to the special interest).
- 3.1.7 The training scheme will arrange an attachment that fulfils the requirements of the special interest curriculum as described in this document. The caseload of the attachment(s) must be sufficient to gain adequate training and experience to undertake safe independent practice as a consultant.
- 3.1.8 Supervision during training must be conducted by those who are appropriately skilled in gastrointestinal and hepatobiliary radiology and teaching. They should have successfully completed training in the principles of equality and diversity. Such skills will require refreshment from time to time.
- 3.1.9 If experience to fulfil the requirements of special interest training cannot be gained in one training centre, it will be necessary for the trainees to have one or more periods of attachment to other training centres. There are, in any case, advantages for trainees in visiting other departments at home or abroad to follow particular interests in greater depth.
- 3.1.10 The expected outcome at the end of this special interest training will be that the trainee can select the appropriate imaging strategy for gastrointestinal and hepatobiliary disorders, supervise (and perform where appropriate) the appropriate examination(s) and accurately report on the findings. The trainee will be competent in all areas of GI imaging and GI intervention as appropriate.
- 3.1.11 There will be continuing development of generic professional competencies

3.2 **Overview of training**

- 3.2.1 The main document, to which this appendix should be regarded as an attachment, *Structured Training Curriculum for Clinical Radiology*, outlines objectives, knowledge, skills and experience and optional experience acquired during core training. The trainee undergoing special interest training will be actively involved in gastrointestinal and hepatobiliary imaging within an educational environment with graduated supervision.

- 3.2.2 The training department must provide access to appropriate computed tomography (CT), magnetic resonance imaging (MRI), ultrasound (US), radionuclide imaging and fluoroscopy. Centres will also provide access to relevant specialised radionuclide imaging, e.g. positron emission tomography (PET)
- 3.2.3 Clinical knowledge will be acquired by a variety of means, including close liaison with appropriate medical, surgical and oncological teams and combined clinical and radiological meetings. Multidisciplinary meetings will be emphasised. The following inter-relationships are important:
- Hepatology
 - Luminal gastrointestinal gastroenterology
 - Upper gastrointestinal surgery
 - Hepatobiliary surgery
 - Colorectal surgery
- 3.2.4 The trainee will be encouraged and trained to participate fully in appropriate clinicrodiology and multidisciplinary meetings.
- 3.2.5 The trainee will be encouraged to attend appropriate educational meetings and courses and to access relevant e-learning material.
- 3.2.6 The trainee will participate in relevant clinical audit, management, and clinical governance, and have a good working knowledge of local and national guidelines in relation to radiological practice.
- 3.2.7 The trainee will contribute to the teaching programme of the training centre. They will provide appropriate clinical supervision of other healthcare professionals and develop competence as a clinical supervisor.
- 3.2.8 Trainees will be expected to be familiar with current gastrointestinal and hepatobiliary radiology literature.
- 3.2.9 The trainee will be encouraged to participate in research and to pursue a project (or projects) up to and including publication. An understanding of the principles and techniques used in research, including the value of clinical trials and basic biostatistics, will be acquired. Presentation of research and audit results at national and international meetings will be encouraged.
- 3.2.10 The trainee will continue to participate in the trainee general on-call rota, with appropriate consultant back-up.

3.3 General Principles of Gastrointestinal and Hepatobiliary Imaging

Objective	Knowledge	Skills
Understand the basis of gastrointestinal and hepatobiliary imaging	Is familiar with the embryology, anatomy, physiology, pathology and mechanisms of disease of both the gastrointestinal tract and hepatobiliary conditions Has a good working knowledge of normal anatomical variants	
Can describe the full range of diagnostic techniques available	Knows the indications, contraindications and complications of each imaging method. Understands the factors affecting the choice of contrast media and pharmaceuticals. Can describe the effects and side effects of these agents. Able to select the optimum imaging method and pathway for different pathological conditions	Conducts and supervises gastrointestinal and hepatobiliary techniques to high standard. Accurately performs biopsy of liver and abdominal masses. Accurately performs abdominal drainage procedures Safely and effectively performs interventional techniques, including stenting of both the lumen and hepatobiliary tracts
Is aware of current developments in gastrointestinal and hepatobiliary radiology	Able to describe recent advances in imaging Able to describe current NICE guidance.	Obtains appropriate training for new interventional procedures
Understands the role of multidisciplinary meetings	Able to plan effective imaging pathways. Can describe the staging for malignant diseases. Detects errors in diagnosis and complications in treatment. Promotes an understanding of relevant gastrointestinal and hepatobiliary pathology	Able to communicate effectively and work in a multidisciplinary team
Understands the clinical aspects of gastrointestinal and hepatobiliary diseases	Is familiar with the clinical management pathways for gastrointestinal and hepatobiliary disorders	Able to confidently discuss the appropriate imaging strategy with the referring clinicians

Imaging Procedures (non-interventional)

Objective	Knowledge	Skills
Able to perform and interpret plain film x-rays used in gastrointestinal and hepatobiliary radiology	Understands the basic principles of plain film radiography.	Able to interpret images using plain film radiography.
Able to perform and interpret ultrasound used in gastrointestinal and hepatobiliary radiology	Able to describe the range of pathological appearances seen in gastrointestinal and hepatobiliary on ultrasound	Competent in the use of ultrasonography for the abdominal organs and where appropriate the small and large bowel. An understanding of the role of Doppler ultrasound. <i>Optimal Skills.</i> The role and use of contrast enhanced ultrasound Endorectal ultrasound Endoscopic ultrasound

Able to perform and interpret computerised tomography relevant to gastrointestinal and hepatobiliary radiology	Able to describe the protocols and image processing techniques used in CT of gastrointestinal and hepatobiliary radiology	<p>Able to interpret CT studies performed for the investigation of both acute abdominal conditions and the role of CT in the management of chronic conditions of the abdomen</p> <p>Able to interpret CT images used in the diagnosis of benign and malignant pathology and staging of tumours involving the gastrointestinal and hepatobiliary system.</p> <p>Able to understand the developing role of abdominal CT in specialist areas within the abdomen i.e. CT colonography</p>
To be familiar with the use of magnetic resonance imaging in GI disorders	Give detailed descriptions of imaging protocols used for gastrointestinal and hepatobiliary investigation	<p>Be able to identify the role of MR in liver disease including MRCP, diffuse disease and in the diagnosis of benign and malignant focal liver lesions.</p> <p>Understand the role of MR in staging rectal cancers</p> <p>Understand the role of MR in identifying complications of inflammatory bowel disease.</p>
Define the role of nuclear medicine in the investigation of GI disorders	Describe the range of normal and abnormal appearance in isotope imaging of the liver and GI tract	<p>Able to accurately interpret isotopic imaging of the hepatobiliary and GI tract</p> <p>Have an appreciation of the role of PET scanning in the staging of GI malignancy</p>
Fluoroscopy	Understand the role of fluoroscopic investigation in the management pathways for gastrointestinal and hepatobiliary radiology	Able to perform a wide range of fluoroscopically guided examinations/interventions (see below).

Gastrointestinal and Hepatobiliary Interventional Techniques

Objective	Knowledge	Skills
Be familiar with the principles of interventional radiological practice	<p>Be able to describe the basic principles of safe interventional technique.</p> <p>Describe the anatomy relevant to the procedure.</p> <p>Describe the recognised complications of the procedures.</p> <p>Understand the therapeutic actions and complications of injected agents.</p> <p>Describe techniques for radiation dose reduction to operator and patient.</p>	<p>Good hand-eye co-ordination</p> <p>Able to work effectively with fluoroscopic imaging, ultrasound and CT guided intervention</p>
Be familiar with a wide range of interventional techniques used in gastrointestinal and hepatobiliary radiology		<p>Able to perform biopsy of abdominal masses</p> <p>Able to perform drainage procedures within the abdominal cavity.</p> <p>Have a clear understanding of the role</p>

		<p>of stenting the GI tract, both oesophageal and rectal.</p> <p>Understand the role of interventional radiology in providing support for nutritional access i.e. PEG</p> <p>Basic understanding of the role of interventional radiology in managing biliary obstruction.</p> <p><i>Optimum experience.</i> Able to perform biliary intervention</p> <p>Appreciate the role of vascular intervention in the liver i.e. TIPSS, chemo-embolisation</p> <p>Appreciate and understand the role of ablative therapies within the liver for the treatment of malignancy</p>
Be proficient in the safe practice of analgesia and sedation in interventional practice	Describe the pharmacological actions of the agents used in analgesia and sedation	Able to administer the appropriate agents in the correct dose in the clinical situation and monitor the patient
Be competent in intermediate life support and anaphylaxis treatment	Describe the processes and actions required in intermediate life support and management of anaphylaxis	<p>Demonstrate the ability to perform cardiopulmonary resuscitation.</p> <p>Be able to manage the immediate response to acute anaphylaxis</p>

Good Medical Practice

Objective	Knowledge	Skills
Be able to explain interventional procedures	Be able to describe the technique, risks and benefits of a procedure	Obtain informed consent in a clear and effective manner
Conduct good clinical care	Be aware of the limits of personal knowledge	Know when to seek further information or help
Maintain good medical practice	Keep knowledge base up to date	Be able to discuss current medical practice with colleagues and patients
Work in partnership with patients	Be aware of different levels of patient understanding and personality types	<p>To explain diagnostic and therapeutic radiology procedures effectively.</p> <p>Exhibit a flexible approach taking into account different learning styles and expectations of patients</p>
Demonstrate good team working skills	Understand the value of team working	Demonstrate good communication with patients and professional colleagues
Assure and improve the quality of care	Be able to describe an effective clinical governance approach	Participate in clinical governance processes e.g. clinical audit, guidelines development
Develop teaching competencies	Understand the principles of teaching and learning	Conduct teaching sessions in a quality assured training programme and develop competence as a clinical supervisor
Demonstrate Probity	Describe the areas embraced by probity	Demonstrate clarity and honesty in record and document keeping
Maintain Health	Understand the importance of personal health	Demonstrate a commitment to managing personal health.

Note "Good Medical Practice" 2006. GMC

- 3.3.1 Trainees will acquire experience in all the practical procedures listed above, and the number of cases undertaken will be recorded in their logbook. The techniques listed and the time devoted to each will be reviewed at intervals. It is recognised that some studies will become obsolete and new imaging techniques will be developed.
- 3.3.2 Regardless of the imaging technique or procedure concerned, the consultant trainer must be satisfied that the trainee is clinically competent, as determined by an in-training performance assessment, and can consistently interpret the results of investigations accurately and reliably and formulate correct management plans.
- 3.3.3 During the training period the following weekly sessional commitments are suggested as a work profile for special interest trainees. Trainees may follow a suitable work plan for a period of 6 to 24 months depending on their long-term aims:
- MRI (one to two sessions)
 - CT (one to three sessions)
 - US (one to three sessions)
 - Radionuclide imaging (half to one session)
 - Plain film reporting (one to three sessions)
 - Fluoroscopy with or without intervention (half to one session)

This training period should be tailored to the trainees individual requirement with emphasis on either gastrointestinal or hepatobiliary experience. Ample opportunity to develop interventional experience should be provided.

3.4 **Appraisal**

- 3.4.1 Regular appraisal of the trainee will occur as described in the RCR Trainee Personal Portfolio. Appraisal will be conducted at the commencement of each attachment. An educational plan is required. Further appraisals are required at the mid point and end of rotation.

3.5 **Assessment**

- 3.5.1 Methods of trainee assessment will include:
- Regular direct observation of clinical techniques (including communication skills, ability to obtain informed consent and sedation skills) by the trainer and/or external observer
 - Regular formal review of the trainee's skills in the accurate interpretation of investigations for gastrointestinal and hepatobiliary diseases
 - Team assessment of behaviour (TAB)
 - A final assessment of overall professional competence before the final annual review of competence progression (ARCP).

3.6. **Overall Review**

- 3.6.1 Review of training programme
- It is expected that trainees will complete a feedback form (RCR Trainee Personal Portfolio) for each special interest training period undertaken
 - It is expected that the training committee responsible for organising special interest training will review and analyse these feedback forms and act appropriately to ensure that training complies with the relevant special interest curriculum. The analysis and subsequent actions should be formally recorded.
 - The relevant authorities will regularly review these records to ensure that special interest training complies with the appropriate special interest curriculum.
- 3.6.2 Review of special interest curriculum
- The Education Board of the RCR will regularly review this special interest curriculum to ensure that it complies with current gastrointestinal and hepatobiliary radiological practice.

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