



**Clinical
Radiology**

The Royal College of Radiologists

Clinical Radiology Curriculum

Mapping of the 2021
curriculum outcomes
to the 2016 curriculum
competences

11.07.2019

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1. Introduction

The curriculum provides both trainers and trainees with information about the requirements of the training programme, setting a clear picture of what is to be achieved by each level of training.

This mapping document provides trainees already in training, and their supervisors, with a way of identifying how previously achieved competences contribute to progress as defined by the new curriculum.

The new curriculum represents a radical change in how the curriculum content is presented. Mapping from a competency-based framework to a high level outcomes is not straightforward and it is not always possible to map like to like. However, the underlying content of the curriculum is largely unchanged and trainees transitioning to the new curriculum will be able to use this document to identify how their prior learning allows them to meet the requirements of the new curriculum.

The separate tables of presentations and conditions for each special interest area in the 2016 curriculum have been replaced by a single combined table of presentations and conditions in the 2021 curriculum.

2. Behaviours in the workplace

2.1 Professionalism

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To practise radiology employing values, behaviours and relationships that underpin the trust the public has in doctors and in accordance with the current GMC Good Medical Practice guidance. | |
| Outline the concepts of modern medical professionalism | CiP 1 |
| Outline the relevance of professional bodies | CiP 2 |
| Know when to seek support | CiPs 1, 6, 8 |
| Practise with: <ul style="list-style-type: none"> • integrity • compassion • altruism • continuous improvement • humility • excellence • respect for cultural and ethnic diversity • regard for the principles of equity • insight | CiPs 1, 3, 4, 5, 6, 7, 8, 9 |
| Adopt a reflective approach to radiological practice | CiPs 1, 3 |
| Demonstrate insight regarding competence and limitations | CiPs 1, 3, 6, 8, 9 |
| Demonstrate patient-centred practice | CiP 1, 7 |
| Use healthcare resources prudently and equitably | CiPs 1, 2, 4 |
| Act with honesty and sensitivity in a non-confrontational and non-discriminatory manner | CiP 1 |
| Recognise situations when it is appropriate to involve professional bodies | CiP 1, 2, 3, 4 |
| Demonstrate ability to cope with uncertainty | CiP 1, 8 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Show willingness to accept and act positively on appropriate constructive criticism or feedback | CiP 1, 3 |
| Fully incorporate the principles of professionalism in radiological practice | CiPs 1, 3, 4, 5, 6, 7, 8, 9 |

2.2 Working with Colleagues

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| <p>To demonstrate good working relationships with colleagues and other healthcare professionals.</p> <p>To acquire and develop appropriate and effective inter-personal skills, being able to resolve conflicts and develop good working relationships within the team</p> <p>To support team development, bringing together different professions, disciplines and agencies, to provide high quality health care</p> | |
| Clinical Teams: Understand how a team works. Understand the roles & responsibilities of team members within the department and MDT. Know the roles of other clinical specialties and their limitations | CiPs 1, 3, 6, 7, 8, 10, 12 |
| Communication with Colleagues: Describe the principles of good communication and conflict resolution techniques. Describe local procedures and policies for expressing valid concerns about performance of any colleague (Risk Management) | CiPs 1, 3, 6, 7, 8, 10, 12 |
| Complaints: Define local and independent complaints procedures | CiPs 1, 3, 6, 7, 8, 10, 12 |
| Clinical Teams: Show respect for others' opinions. Work conscientiously and co-operatively. Recognise own limitations. Supervise less experienced colleagues | CiPs 1, 3, 6, 7, 8, 10, 12 |
| Communication with Colleagues: Show willingness to participate in MDTs. Treat colleagues fairly. Show willingness to question colleagues' opinions in the interest of patient care | CiPs 1, 3, 6, 7, 8, 10, 12 |
| Complaints: Act promptly, with honesty and sensitivity. Accept responsibility when appropriate | CiPs 1, 3, 6, 7, 8, 10, 12 |
| <p>Be able to articulate points of view and lead in issues of professional debate</p> <p>Engage in and contribute to MDTs and open departmental discussions</p> <p>Demonstrate personal development in communication skills</p> <p>Mentor/support junior staff and allied healthcare professionals guiding them towards improved team-work and communication skills</p> <p>Lead MDT discussions</p> | CiPs 1, 3, 6, 7, 8, 10, 12 |

2.2 Relations and communications with patients

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To maintain good professional relationships with all patients. Conduct professional interactions with vulnerable adults, children and their carers according to legislation. | |
| GMC - Guide to Good Medical Practice | CiP 1 |
| Vulnerable Adults: Knowledge of the definition and assessment of competence in the vulnerable adult. Understand the relevant legislation. | CiPs 1, 2, 7, 9 |
| Children: Child protection legislation | CiPs 1, 2, 7, 9 |
| Treat patients with dignity and as individuals. Recognise the boundaries of the doctor/patient relationship | CiPs 1, 7, 9 |
| Be able to assess the mental /physical capacity of the patient and be able to explain consent procedures to all patients and/or carers in a way that is clearly understood | CiPs 1, 7, 9 |
| Practise within the recognised legislative framework for children | CiPs 1, 7, 9 |
| Approach and listen to patients with an open caring mind | CiP 1 |
| Development of a caring nature and empathy | CiP 1 |
| Recognise challenging professional relationships and seek support | CiPs 1, 3, 6 |
| Respect patients' and carers' views | CiPs 1, 7, 9 |

2.2 Personal qualities

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To develop personal qualities and behaviours necessary to lead but also to follow, when necessary, in dealing with complex situations and conflicting attitudes. | |
| Develop abilities to deal with inappropriate patient and family behaviour | CiPs 1, 9 |
| Respect the rights of all patients including children, vulnerable adults and the elderly | CiPs 1, 2, 7, 9 |
| Understand the need to eliminate all forms of discrimination against patients (age, gender, race, culture, disability, spirituality and sexuality) | CiPs 1, 2, 7, 9 |
| Show awareness of the need to put patient need ahead of self- convenience | CiPs 1, 4, 7, 8, 9 |
| Define the concept of medical professionalism | CiP 1 |
| Understand the relevance and interactions of professional bodies (Royal Colleges, GMC, BMA, medical defence organisations, specialist societies) | CiPs 1, 2 |
| Assume a leadership role where appropriate | CiPs 1, 6 |
| Practise with : <ul style="list-style-type: none"> • integrity • compassion • altruism • continuous improvement • excellence • respect of cultural and ethnic diversity | CiP 1 |
| Work in partnership with allied healthcare professionals | CiPs 1, 6, 8 |
| Recognise and respond appropriately to unprofessional behaviour in others | CiPs 1, 3, 5 |
| Recognise personal beliefs and biases and how they impact on service delivery | CiPs 1, 3 |
| Recognise the need to use all healthcare resources prudently and appropriately | CiPs 1, 2, 3 |
| Recognise the need to improve clinical leadership and management skills | CiPs 1, 2, 3, 5, 6 |
| Recognise the situations when it is appropriate to involve professional and regulatory bodies | CiPs 1, 2, 3, 4, 5 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|------------------------------------|
| Be willing to act as a mentor, educator and role model | CiPs 3, 5, 6 |
| Participate in professional regulation and development | CiPs 1, 3, 5, 6 |
| Recognise the need for equal access to healthcare | CiPs 1, 2 |
| Recognise the need for reliability and accessibility throughout the healthcare team | CiPs 1, 2, 6 |
| Respond positively to criticism and work to improve Involve patients in decision making Demonstrate ability to deliver feedback to members of the clinical team Be able to manage difficult patient interactions and negotiate successful outcomes for patients and team members Create positive open professional environment that is supportive of patients and staff | CiPs 1, 2, 3, 4, 5, 6, 7, 8, 9, 12 |

3. Good clinical care

3.1 Information gathering

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To gather all information relevant to the clinical issue under consideration. To establish a problem list including pre-test probabilities to inform differential diagnosis and formulate an imaging strategy | |
| Comprehends importance of different elements of history and previous investigations | CiPs 7, 8, 9, 11,12 |
| Knows likely causes and risk factors for conditions relevant to mode of presentation | CiPs 7, 8, 9, 11,12 |
| Demonstrates knowledge sufficient to integrate clinical data and radiological features | CiPs 7, 8, 9, 11,12 |
| Recognise that the patient's wishes and beliefs and the history should inform examination, investigation and management | CiPs 7, 8, 9, 11,12 |
| Communicates effectively and in a timely manner with clinical team, and patient if appropriate, to elicit the information required | CiPs 7, 8, 9, 11,12 |
| Performs comprehensive review of all relevant information including referral notes, prior history and imaging and other diagnostic investigations | CiPs 7, 8, 9, 11,12 |
| Assimilates information to establish likely differential diagnosis | CiPs 7, 8, 9, 11,12 |
| Correctly interprets radiological features in the context of available clinical information | CiPs 7, 8, 9, 11,12 |
| Communicates appropriately and with respect with the patient and with all members of the multiprofessional and clinical team | CiPs 1, 4, 6, 8, 9 |
| <p>Is able accurately to summarise the details of patient notes.</p> <p>Demonstrates ability to rapidly obtain relevant information in context of severely ill patients and/or in an emergency situation</p> <p>Synthesises information to establish likely differential diagnosis</p> | CiPs 7, 8, 9, 11,12 |

3.2 Communication of results

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-------------------------------|
| To recognise the fundamental importance of accurate, effective and timely oral and written communication of results | |
| Understands importance of including relevant positive and negative findings in concise result | CiPs 7, 8, 9, 11,12 |
| Understands the principles of information governance and confidentiality | CiPs 7, 8, 9, 11,12 |
| Oral Communication: | |
| With referrer: communicates results if appropriate to the clinical problem, clearly and in a timely manner | CiPs 7, 8, 9, 11,12 |
| With MDT: presents and discusses relevant imaging at MDT and clinic-radiological meetings, clearly and succinctly | CiPs 6, 12 |
| With patient: when appropriate, explains results of imaging clearly and sensitively in a manner that is tailored to the individual and, if appropriate, according to established good practice in breaking bad news | CiPs 1, 8, 9 |
| Written records: | |
| Produces written records which include the following attributes: clear, concise, accurate, addresses clinical question and includes conclusion, recommendation for further management and degree of urgency as appropriate | CiPs 7, 8, 9, 11,12 |
| Documents any procedures in timely manner and in accordance with local guidelines | CiPs 7, 8, 9, 11,12 |
| Prioritises and communicates urgent findings according to RCR and local guidelines | CiPs 7, 8, 9, 11,12 |
| Communicates appropriately and with respect, with the patient and with all members of the multiprofessional clinical team | CiPs 1, 6, 7, 8, 9, 10, 11,12 |
| Communicates significant results directly to clinical teams if appropriate Independently produces reports with the attributes described above Effective independent communicator | CiPs 1, 6, 7, 8, 9, 10, 11,12 |

3.3 Time management and decision-making

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To become increasingly able to prioritise and organise radiological and administrative duties in order to optimise patient care and use of resources. | |
| Understand that some tasks may have to wait or be delegated to others | CiPs 6, 7, 8, 9, 11,12 |
| Understand the importance of prompt investigation, diagnosis and treatment in disease management | CiPs 7, 8, 9, 11,12 |
| Identify radiological and administrative tasks requiring urgent attention | CiPs 7, 8, 9, 10, 11,12 |
| Organise and manage radiological and administrative workload effectively, including lists and clinics where appropriate | CiPs 7, 8, 9, 11,12 |
| Estimate the time likely to be required for essential tasks and plan accordingly | CiPs 7, 8, 9, 11,12 |
| Delegate tasks and work to others appropriately and safely, when necessary | CiPs 7, 8, 9, 11,12 |
| Behaviours: | |
| Ability to work flexibly and deal with tasks in an effective fashion | CiPs 7, 8, 9, 11,12 |
| Recognise when you or others are falling behind and take steps to rectify the situation | CiPs 6, 7, 8, 9, 11,12 |
| Communicate changes in priority to others | CiPs 6, 7, 8, 9, 11,12 |
| Remain calm in stressful or high pressure situations and adopt a timely, rational approach | CiPs 1, 7, 8, 9, 11,12 |
| Recognises the most important tasks and responds appropriately Anticipates when priorities should be changed Leading and directing the radiological team in an effective manner Supports others who are falling behind Communicates and delegates rapidly and clearly Calm leadership in stressful situations | CiPs 1, 6, 7, 8, 9, 11,12 |

3.4 Therapeutics and safe prescribing

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To prescribe, review and monitor appropriate therapeutic interventions relevant to clinical practice including non – medication based therapeutic and preventative indications. | |
| Indications, contraindications, side effects, drug interactions and dosage of commonly used drugs in radiology | CiP 9 |
| Knowledge of drugs requiring therapeutic drug monitoring and interpret results | CiP 9 |
| Understand the indications for and drugs used for DVT prophylaxis | CiP 9 |
| Understand patient safety and prescribing, including electronic clinical record systems and other IT systems | CiP 3, 9 |
| Understand the roles of regulatory agencies involved in drug use, monitoring and licensing (e.g. National Institute for Clinical Excellence (NICE), Committee on Safety of Medicines (CSM), and Healthcare Products Regulatory Agency and hospital formulary committees | CiPs 2, 9 |
| Review the continuing need for, effects and adverse effects of, long term medications relevant to the trainee's clinical practice | CiP 9 |
| Anticipate and avoid defined drug interactions | CiP 9 |
| Prescribe appropriate DVT prophylaxis | CiP 9 |
| Advise patients (and carers) about important interactions and adverse drug effects relevant to radiology | CiP 9 |
| Prescribe appropriately in pregnancy, and during breast feeding | CiPs 7, 9 |
| Make appropriate dose adjustments following therapeutic drug monitoring, or physiological change (e.g. deteriorating renal function) | CiPs 7, 9 |
| Recognise the importance of resources when prescribing, including the role of a Drug Formulary and electronic prescribing systems | CiPs 2, 9 |
| Remain open to advice from other health professionals on medication issues | CiPs 1, 7, 9 |
| Ensure prescribing information is shared promptly and accurately between a patient's health providers, including between primary and secondary care | CiPs 6, 9 |
| Participate in adverse drug event reporting mechanisms | CiPs 3, 9 |
| Remain up to date with therapeutic alerts, and respond appropriately | CiPs 7, 9 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Knows how to report adverse effects and take part in this mechanism Aware of the regulatory bodies relevant to prescribed medicines both locally and nationally | CiPs 1, 2, 3, 6, 7, 9 |

3.5 The safe use of sedation and analgesia

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To prescribe, administer and monitor the use of sedation and analgesia within clinical radiological practice. | |
| Indications, contraindications, side effects, drug interactions, reversal and dosage of commonly used sedative and analgesic agents | CiP 9 |
| Knowledge of range of adverse drug reactions to commonly used sedative and analgesic agents | CiP 9 |
| Knowledge of drugs requiring therapeutic drug monitoring and interpret results | CiP 9 |
| Be aware of other means of obtaining patient co-operation for radiological examinations without need for patient sedation or analgesia e.g. play therapy in paediatric radiology | CiP 9 |
| Access information to promote patient safety and prescribing, including electronic clinical record systems and prescribing references | CiP 9 |
| Anticipate and avoid defined drug interactions, including appropriate use of reversal agents | CiP 9 |
| Advise patients (and carers) about important interactions and adverse drug effects | CiP 9 |
| Prescribe appropriately for safe sedation and analgesia including patient controlled analgesia | CiP 9 |
| Make appropriate dose adjustments in relation to administration of sedatives or analgesics following physiological change (e.g. BMI, age, liver/renal function, respiratory/cardiac disease) | CiP 9 |
| Understand the requirements for and principles of monitoring patients during and post sedation/analgesia administration | CiP 9 |
| Obtain appropriate consent in relation to the use of sedation/analgesia | CiP 9 |
| Formal appropriate level of resuscitation training | CiP 9 |
| Remain up to date with therapeutic alerts, and respond appropriately | CiP 9 |
| Develop open team approach in relation to the delivery of sedation/analgesia services including close links with the anaesthetic department | CiP 9 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| <p>Maximise patient compliance by utilising sedatives/analgesics in an individually tailored fashion that is compatible with optimal patient care</p> <p>Maximise patient compliance by providing full explanations of the need for sedation/analgesia</p> <p>Know how to report adverse effects and take part in this mechanism</p> <p>Be aware of the regulatory bodies relevant to prescription of sedation/analgesia both locally and nationally</p> | CiP 9 |

4. Managing long term conditions

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To pursue a holistic and long term approach to the planning and implementation of patient care, in particular to identify and facilitate the patient's role in their own care | |
| Understand the natural history of diseases and illnesses that run a chronic course | CiPs 7, 8, 9, 11, 12 |
| Understand the role of rehabilitation services and the multi-disciplinary team to facilitate long-term care | CiPs 7, 8, 9, 11, 12 |
| Understand the concept of quality of life and how this can be measured whilst understanding the limitations of such measures for individual patients | CiPs 7, 8, 9, 11, 12 |
| Provide relevant evidenced based information to clinicians and where appropriate effective patient education, with support of the multi-disciplinary team | CiPs 6, 7, 8, 9, 11, 12 |
| Provide relevant evidenced based information with support of the multi-disciplinary team | CiPs 6, 7, 8, 9, 11, 12 |
| Provide the relevant and evidence based information to the multidisciplinary team and to the patient in an appropriate medium to enable sufficient choice, when possible | CiPs 6, 7, 8, 9, 11, 12 |
| Show willingness and support for patient in his/her own advocacy, within the constraints of available resources and taking into account the best interests of the wider community | CiPs 7, 8, 9, 11, 12 |
| Show willingness to maintain a close working relationship with other members of the multi-disciplinary team, primary and community care | CiPs 6, 7, 8, 9, 11, 12 |
| <p>Demonstrates awareness of management of long term conditions relevant to the trainees practice</p> <p>Provides the patient with evidence based information and assists the patient in understanding this material and utilises the team to promote excellent patient care</p> <p>Develops management plans in partnership with the patient and clinical teams that are pertinent to the patients long term condition</p> <p>Contributes to the multidisciplinary team that is responsible for management of patients with long term conditions</p> <p>Helps the patient networks develop and strengthen</p> | CiPs 6, 7, 8, 9, 11, 12 |

5. Infection control

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To manage and control infection in patients attending a clinical radiology department. This includes controlling the risk of cross-infection, appropriately managing infection in individual patients, and working appropriately within the wider community to manage the risk posed by communicable diseases. | |
| Know the importance of hand hygiene, equipment cleaning and Aseptic Non-Touch Technique in reducing Health Care Associated Infection (HCAI) | CiP 9 |
| Know when to use personal protective equipment (PPE) | CiP 9 |
| Know when to use and the principles of an Aseptic Non-Touch Technique (ANTT) | CiP 9 |
| Know the action required in a needle stick injury | CiP 9 |
| Know the responsibilities of the individual and employer in reducing HCAI | CiP 9 |
| Relevant Literature: Trust Infection Control Policy / epic2 / DH saving lives document / NPSA guidelines | CiP 9 |
| Good practice in hand washing and equipment cleaning | CiP 9 |
| Appropriate use of PPE | CiP 9 |
| Aseptic Non-Touch Technique | CiP 9 |
| Safe disposal of sharps | CiP 9 |
| To adhere to Trust infection control policies | CiP 9 |
| To attend local mandatory training | CiPs 9, 11 |
| To partake in and learn from relevant audit | CiP 9 |
| Encourage all staff, patients and relatives to observe infection control principles | CiP 9 |
| Recognise the risk of personal ill-health as a risk to patients and colleagues in addition to its effect on performance and behaves responsibly and appropriately | CiP 9 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| <p>Identify the possibility of unusual and uncommon infections and the potential for atypical presentation of more frequent infections</p> <p>Work in collaboration with diagnostic departments to investigate and manage the most complex types of infection including those potentially requiring isolation facilities</p> <p>Work in collaboration with external agencies to manage the potential for infection control within the wider community including communicating effectively with the general public and liaising with regional and national bodies where appropriate</p> | CiP 9 |

6. Clinical Governance, Risk Management, Audit and Quality Improvement

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| <p>To be fully aware of risk management issues as applicable to the practice of radiology</p> <p>To fully incorporate the principles of clinical governance into day to day clinical practice</p> <p>To recognise the desirability of monitoring performance, learning from mistakes and openness in order to ensure high standards of care and to optimise patient safety</p> | |
| Possess knowledge of risk management issues pertinent to an imaging department | CiPs 3, 4, 9, 10, 11 |
| Know the complications, risks and side effects of imaging investigations and treatments including ionising radiation and other biohazards. Understand the mechanisms to reduce risk | CiPs 7,9,10 |
| Understand the elements of clinical governance | CiP 3 |
| Recognise that governance safeguards high standards of care and facilitates the development of improved clinical services | CiP 3 |
| Define local and national significant event reporting systems relevant to specialty | CiP 3 |
| Recognise importance of evidence-based practice in relation to clinical effectiveness | CiP 4, 7 |
| Understand the use of patient early warning systems to detect clinical deterioration where relevant to outcomes | CiP 3 |
| Keep abreast of national patient safety initiatives including National Patient Safety Agency, NCEPOD reports, NICE guidelines etc. | CiP 3 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Shows knowledge of: <ul style="list-style-type: none"> • quality improvement • medical and clinical audit • research and development • integrated care pathways • evidence-based practice • clinical effectiveness • clinical risk systems • medical error • complaints procedures and the Duty of Candour • risk assessments • knows the benefits that a patient might reasonably expect from clinical governance | CiP 3 |
| Be an active participant in clinical governance, audit and quality improvement | CiP 3 |
| Discuss relevant risks with patients and obtain informed consent | CiP 9 |
| Be able to balance risks and benefits with patients | CiP 9 |
| Adopt strategies to reduce risk e.g. evidence based practice, reference to previous examinations | CiP 4, 7 |
| Contribute to quality improvement processes e.g. <ul style="list-style-type: none"> • audit of personal and departmental performance and the development and delivery of improvements • errors / discrepancy meetings • critical incident reporting • root cause analysis including the contribution of human factors • unit morbidity and mortality meetings • local and national databases e.g. READ (Radiology Events and Discrepancies), an RCR initiative for the confidential sharing of radiology incidents, events and discrepancies • patient safety improvement plans • departmental assurance systems such as ISAS (Imaging Services Accreditation Scheme) • Safer Clinical Systems- review and redesign (e.g. design systems to reduce risk during handover of on call cases; design systems and processes that ensure acute imaging requests are undertaken in a safe and timely manner) | CiP 3 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Maintain a folder of information and evidence, drawn from individual medical/radiological practice | CiPs 3,4 |
| Reflect regularly on standards of medical practice in accordance with GMC guidance on licensing and revalidation | CiPs 3,4 |
| Reflect on serious incidents (SIs) and complaints | CiPs 3,4 |
| Be able to handle and deal with complaints in a focused and constructive manner | CiPs 1, 3,4 |
| Respect individual patient choice and make patient care your first concern | CiP 1 |
| Respect patients' privacy, dignity and confidentiality | CiP 1 |
| Be truthful and admit error; engage with an open no blame culture and be prepared to learn from mistakes, errors and complaints | CiP 1 |
| Show willingness to participate in safety improvement strategies such as critical incident reporting, safety improvement plans and quality improvement projects | CiPs 1, 3 |
| Respond positively to outcomes of audit and quality improvement | CiPs 1, 3 |
| Co-operate with changes necessary to improve service quality and safety | CiPs 1, 3 |
| Practice evidence-based medicine | CiPs 1, 3, 4, 7 |
| Recognise the importance of teamwork and share best practice with others | CiPs 1, 3, 4, 6 |
| Full incorporation of risk management issues in relation to the practice of radiology Demonstrates personal and service performance improvement Leads in review of patient safety issues Implements change to improve service | CiPs 3, 4, 7, 9, 10, 11 |

7. Leadership/Management development

7.1 Leadership

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To recognise the desirability of involvement in medical leadership and assume increasing leadership roles | |
| Describe the principles of effective leadership | CiP 5, 6, 12 |
| Assume a leadership role | CiPs 1, 3, 5, 6, 12 |
| Ability to: <ul style="list-style-type: none"> • delegate • manage time • make decisions • negotiate • challenge • respond positively to challenge | CiPs 1, 3, 5, 6, 12 |
| Act professionally | CiP 1, 3, 5, 6 |
| Be willing to ask for help | CiPs 1, 3, 6, 8, 9 |
| Incorporation of leadership skills and qualities into day to day radiological practice Independent practice with reference to leadership roles | CiPs 1, 3, 6, 8, 9, 12 |

7.2 NHS structure

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To understand the structure of the NHS and the management of local healthcare systems in order to be able to participate fully in managing healthcare provision | |
| Understand the guidance given on management and doctors by the GMC | CiP 2 |
| Understand the local structure of NHS systems in your locality recognising potential differences between the four countries of the UK | CiP 2 |
| Understand the structure and function of the healthcare system as they apply to your speciality | CiP 2 |
| Awareness and principles of: <ul style="list-style-type: none"> • clinical coding • european Working Time Regulations • national Service Frameworks • health Regulatory Agencies (NICE) • NHS Structure and Finance • consultant contract • resource allocation • role of Independent Sector Providers • commissioning | CiP 2 |
| Describe the principles of Recruitment and Appointment procedures | CiP 2 |
| Participate in managerial meetings | CiPs 2, 6 |
| Take an active role in promoting the best use of healthcare resources | CiPs 2, 3 |
| Work with stakeholders to create a sustainable patient-centred service | CiPs 1, 2, 3, 6 |
| Employ new technologies safely and wisely | CiPs 2, 7 |
| Recognise the importance of just allocation of healthcare resources | CiPs 2 |
| Recognise the varying roles of doctors, patients and carers as active participants in healthcare systems | CiPs 1, 2 |
| Take part in service development, quality and safety improvement | CiPs 2, 3 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Show willingness to improve managerial skills | CiP 2 |
| Engage in management activities (rota/audit lead, trainee representative on departmental/directorate management committee, interview panels) | CiP 2 |
| <p>Describe the relationship between commissioners, General Practice and secondary care providers</p> <p>Participates in team and clinical directorate meetings including discussions around service development</p> <p>Discuss the most recent guidance from relevant health regulatory agencies in relation to speciality.</p> <p>Describe the funding and structure of health services and how they relate to regional or devolved administration structures.</p> <p>Participate in collaborative discussions with directorate and other stakeholders to ensure that all needs and views are considered in managing services.</p> | CiPs 1, 2, 3, 6, 7 |

7.3 Media awareness

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To recognise the importance of media awareness and public communications in healthcare delivery | |
| Know the importance of media awareness and public communications training and where to obtain it | CiP 2 |
| Recognise situations when media awareness and public communication skills are of value. | CiP 2 |
| Recognise when it may be appropriate to implement such training and/or seek further advice from the Trust | CiP 2 |
| Be able to handle enquires from press and other media effectively | CiP 2 |
| Act professionally | CiPs 1, 2 |
| Be willing to ask for help | CiPs 1,2 |

8. Ethical and legal issues

8.1 Medical ethics and confidentiality

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To know, understand and apply appropriately the principles, guidance and laws regarding medical ethics and confidentiality | |
| Demonstrate knowledge of the principles of medical ethics | CiPs 1, 2, 4, 9 |
| Outline and follow the guidance given by the GMC on confidentiality. Define the provisions of the Data Protection Act and Freedom of Information Act | CiPs 1, 2, 4 |
| Define the role of the Caldicott Guardian within an institution and outline the process of attaining Caldicott approval for audit or research | CiP 4 |
| Outline the procedures for seeking a patient's consent for disclosure of identifiable information | CiP 4 |
| Outline situations where patient consent, while desirable, is not required for disclosure e.g. public interest | CiP 4 |
| Recognise the problems posed by disclosure in the public interest, without patient's consent | CiP 4 |
| Recognise the factors influencing ethical decision making: religion, moral beliefs, cultural practices | CiPs 1, 2 |
| Outline the principles of the Mental Capacity Act | CiPs 1,2 |
| Use and share information with the highest regard for confidentiality, and encourage such behaviour in other members of the team | CiPs 1, 2, 4, 5 |
| Use and promote strategies to ensure confidentiality is maintained e.g. anonymisation | CiPs 1, 2, 4 |
| Counsel patients on the need for information distribution within members of the immediate healthcare team | CiPs 1, 2, 4 |
| Counsel patients, family, carers and advocates tactfully and effectively when making important decisions regarding treatment | CiPs 1, 2, 4 |
| Counsel patients on the need for information distribution within members of the immediate healthcare team and seek patients' consent for disclosure of identifiable information | CiPs 1, 2, 4, 5, 6, 7, 8, 9 |
| Able to assume a full role in making and implementing important decisions regarding treatment | |

8.2 Valid consent

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To obtain valid consent from the patient | |
| Outline the guidance given by the GMC on consent, in particular <ul style="list-style-type: none"> • understand the consent process may culminate in, but is not limited to, the completion of the consent form. • understand the particular importance of considering the patient's level of understanding and mental state (also that of the parents, relatives or carers when appropriate) and how this may impair their capacity for informed consent | CiP s1, 2 |
| Present all information to patient (and carers) in a format they understand allowing time for reflection on the decision to give consent | CiP s1, 2, 4, 7, 9 |
| Provide a balanced view of all care options | CiP s1, 2, 4, 7, 9 |
| Respect a patient's right of autonomy even in situations where their decision might put them at risk of harm | CiP s1, 2, 4, 7, 9 |
| Avoid exceeding the authority given by a patient | CiP s1, 2, 4, 7, 9 |
| Avoid withholding information relevant to proposed care or treatment in a competent adult | CiP s1, 2, 4, 7, 9 |
| Show willingness to seek advance directives | CiP s1, 2, 4, 7, 9 |
| Show willingness to obtain a second/senior opinion and legal advice in difficult situations of consent or capacity | CiP s1, 2, 4, 7, 9 |
| Inform a patient and seek alternative care where personal, moral or religious belief prevents a usual professional action | CiP s1, 2, 4, 7, 9 |

8.3 Legal framework of medical practice

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|----------------------------------|
| To know, understand and act appropriately within the legal framework for practice | |
| Awareness of the following legislative pathways and potential differences within the disparate nations of the UK: <ul style="list-style-type: none"> • child protection and protection of vulnerable adults • mental health legislation: the powers to detain a patient and giving emergency treatment against patient's will under common law • death certification and role of coroner / procurator fiscal • advance directives and living wills • withdrawing and withholding treatment • decisions regarding resuscitation status of patients • surrogate decision making such as Power of Attorney • organ donation and retention and awareness of local procedures • communicable disease notification • data Protection and Freedom of Information Acts | CiPs 1, 2, 3, 4, 5, 7, 8, 10, 12 |
| Outline sources of medico-legal information | CiPs 1, 2, 3, 4, 5, 8 |
| Outline the process of discipline in the event of medical malpractice | CiPs 1, 2, 3 |
| Outline the procedure to be followed when abuse is suspected | CiPs 1, 2, 3, 5, 8 |
| Show willingness to seek advice from the Healthcare Trust, legal bodies (including defence unions), and the GMC on medico-legal matters | CiPs 1, 2, 3, 4 |
| Promote reflection on legal issues by members of the team | CiPs 1, 2, 3, 5, 6 |
| Readily seek advice from healthcare trust, legal bodies and the GMC on medico-legal matters | CiPs 1, 2, 3, 4, 5, 7, 8, 10, 12 |

8.4 Equality and diversity

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To respect and have good interactions with patients and colleagues from diverse backgrounds | |
| Describe the equality and diversity framework | CiPs 1, 2 |
| Understand the importance of equality and cultural diversity. Follow an open-minded approach to equality and diversity in all aspects of radiological practice | CiPs 1, 2 |
| Be sensitive to and show consideration for the ways in which patients' cultural and religious beliefs may affect their approach to radiological procedures. Respond respectfully to the cultural and religious needs of the patient | CiPs 1, 2, 7, 9 |
| Understand that patients' religious and cultural beliefs may conflict with best radiological practice. Know where to find legal and ethical guidelines to assist in resolving difficulties | CiP 1, 2, 7, 9 |
| Be aware of the ways in which trainees' personal experiences, values and attitudes might affect their professional practice and know when to refer a case to another colleague | CiPs 1, 2, 5 |
| Ensure that an equal, non-discriminatory approach is adopted in interactions with both patients and colleagues | CiP 1, 2, 6, 7, 9 |
| Recognise the interaction between mental health and physical health, and that there cannot be good health without good mental health. | CiP 1 |
| Be aware of the role that individuals and services can play in combating inequality and discrimination and contribute appropriately to this work | CiPs 1, 2, 6, 7, 9 |
| Ensure that all decisions and actions are in the best interests of the patient | CiPs 1, 2 |
| Communicate with patients and colleagues from diverse backgrounds | CiP 1, 5, 6 |
| Respect diversity and recognise the benefits it may bring, as well as associated stigma | CiP 1, 2, 5, 7 |
| Be aware of the possible influence of, and sensitively deal with issues concerning socio-economic status during interactions with patients | CiP 1, 5, 6, 7 |
| Be able to communicate effectively with patients from diverse backgrounds and with special communication needs | CiP 1 |
| Respect diversity within clinical practice | CiP 1, 5, 6, 7, 12 |
| Recognise issues of health that are related to social class | CiP 1, 2, 7 |
| Adopt assessments and interventions that are inclusive, respectful of diversity and patient-centred | CiP 1, 2, 7, 12 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Respect diversity of status and values in patients and colleagues | CiPs 1, 6, 7, 9, 12 |
| Accept uncertainty arising from differences in values | CiP 1 |
| Independent practice in accordance with guidance on equality and diversity | CiPs 1, 2, 5, 6, 7, 9, 12 |

9. Maintaining good medical practice

91 Insight

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To recognise the fundamental importance of integration of clinical information together with radiological features | |
| Be willing to consult, to admit mistakes and to learn from adverse events | CiPs 1, 3, 6, 7, 8, 9 |
| Use and share information with other members of the team to improve patient outcomes | CiPs 1, 3, 6, 7 |
| Reflects on own practice | CiP 3, 8, 9 |
| Able to negotiate and discuss personal and team limitations | CiP 3, 6 |
| Be willing to consult and to admit mistakes | CiPs 1, 3, 6, 8, 9 |
| Show willingness to seek the opinion of others when making important decisions regarding patient investigation and treatment | CiP 3, 6, 7, 8, 9 |
| Encourages a climate of openness and reflection | CiP 3, 6 |
| Recognises limitations and displays the ability to address any deficiencies in clinical/radiological knowledge or skills Sound appreciation of limitations of self and others Demonstrates well developed strategies to address personal or team member deficiencies | CiPs 1, 3, 6, 7, 8, 9 |

92 Lifelong learning

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Recognise the need for continued learning as a fundamental component of medical practice | |
| Recognise the importance of continuing professional development | CiP 3 |
| Recognise and use learning opportunities to keep up to date | CiP 3 |
| Maintain a professional portfolio and use this to stimulate professional development | CiP 3 |
| Monitor own performance through audit and feedback | CiPs 3, 8 |
| Be self-motivated and eager to learn | CiP 3 |
| Show willingness to learn from colleagues and to accept constructive feedback | CiPs 3, 8 |
| Assumption of responsibility for personal life – long continuing professional development and monitoring of own performance | CiPs 3, 8 |

93 Ethical research

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To recognise the fundamental importance of research in medicine. To develop understanding and apply the principles, guidance and laws regarding ethical research. | |
| Outline the GMC guidance on good practice in research | CiP 4 |
| Outline the differences between audit and research | CiPs 3, 4 |
| Demonstrate a knowledge of research principles | CiPs 4, 7 |
| Outline the principles of formulating a research question and designing a project | CiP 4 |
| Know how to conduct a literature review | CiP 4, 7, 12 |
| Comprehend principal qualitative, quantitative, bio-statistical and epidemiological research methods | CiP 3, 4 |
| Outline sources of funding relevant for NHS research | CiP 4 |
| Develop critical appraisal skills and apply these when reading literature | CiP 4 |
| Demonstrate the ability to write a scientific paper | CiP 4 |
| Apply for appropriate ethical research approval | CiP 4 |
| Demonstrate the use of literature databases | CiPs 7, 12 |
| Demonstrate good verbal and written presentations and poster skills | CiP 4 |
| Understand the difference between population-based assessment and unit-based studies and be able to evaluate outcomes for epidemiological work | CiP 4 |
| Ability to collect and manage research data | CiP 4 |
| Recognise the ethical responsibilities to conduct research with honesty and integrity, safeguarding the interests of the patient and obtaining ethical approval when appropriate | CiP 1, 4 |
| Follow guidelines on ethical conduct in research and consent for research | CiP 1, 4 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Show willingness to the promotion and involvement in research | CiP 4 |
| Awareness of scientific misconduct | CiP 4 |
| Comprehend the principles of qualitative, quantitative, bio-statistical and epidemiological research methods Demonstrate the ability to write a scientific paper Demonstrate the use of literature data-bases Good verbal and written presentation and poster skills Knowledge of sources of research funding Able to evaluate outcomes from differing types of epidemiological work Optional: Good Clinical Practice certificate Participate in department based research | CiP 1, 3, 4, 7, 12 |

94 Evidence based practice

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|------------------------------|
| To employ an evidence based approach in the practice of radiology | |
| Define the principles of evidence-based medicine | CiPs 3, 4, 7 |
| Appreciate the role of guidelines | CiPs 2, 3, 4, 7, 12 |
| Describe how clinical guidelines are produced | CiPs 2, 3, 4, 7, 12 |
| Be able to critically appraise evidence | CiPs 2, 3, 4, 7, 12 |
| Demonstrate the ability to utilise guidelines | CiPs 2, 3, 4, 7, 12 |
| Be able to contribute to the evolution of guidelines | CiPs 2, 3, 4, 7, 12 |
| Respect individual patient choice | CiPs 1, 7, 8, 9 |
| Be truthful and admit error | CiPs 1, 3 |
| Full use of evidence based approach in the practice of radiology Understands how clinical guidelines are produced and their role in ethical research | CiPs 1, 2, 3, 4, 7, 8, 9, 12 |

95 Information technology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To recognise the fundamental importance of the acquisition of information technology skills to radiological practice | |
| Understand modern communication, search strategies, data storage and security | CiPs 2, 3, 5, 8 |
| Demonstrate competent use of relevant computer technology | CiPs 2, 3, 5, 8 |
| Engage with information technology relevant to clinical practice | CiPs 2, 3, 5, 8 |
| Full acquisition of IT requirements for the practice of radiology | CiP 2, 3, 5, 8 |

10. Teaching and training

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To recognise the fundamental importance of understanding the value of teaching and training in clinical practice. To develop strategies for delivering education and assessment in a wide variety of formal and informal settings | |
| Acknowledgement of the multi-faceted nature of knowledge as it relates to medical practice. | CiP 5 |
| Understand the importance of a positive & constructive approach to mentoring & educational supervision | CiP 5, 6 |
| Develop an understanding of a range of adult learning principles: <ul style="list-style-type: none"> • identify leaning styles • construct educational objectives • use appropriate questioning techniques • vary teaching formats & stimuli | CiP 5 |
| Understand the structure and differences between appraisal and assessment | CiPs 5, 6 |
| Delivery of varying teaching formats and stimuli to suit subject and situation | CiP 5 |
| Demonstrate effective presentation of information in a variety of ways: lecture, small group presentations, written hand-outs, power-point presentations | CiP 5 |
| Provide effective feedback and help develop reflective practice | CiPs 3, 5, 6 |
| Promote patient education | CiPs 1, 5, 7, 9 |
| Undertake and deliver workplace based assessment | CiP 5 |
| Demonstrate a positive approach to both giving and receiving mentoring and educational supervision | CiPs 3, 5, 6 |
| Promote and encourage a constructive knowledge-sharing environment | CiPs 3, 5 |
| Balances the needs of service delivery with educational imperative | CiPs 3, 5 |
| Show willingness to participate in giving formal tuition in radiological/medical education | CiP 5 |
| Recognise the importance of personal development as a teacher in relation to aspects of good professional behaviour | CiPs 3, 5, 6 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Maintain honesty and objectivity during appraisal and assessment | CiPs 5, 6 |
| Engages in teaching delivery to allied health professionals and clinical groups Partakes and encourages WpBA and reflective practice Leads teaching episodes Develops and delivers new opportunities to enhance learning and teaching with clear objectives and outcomes Able to act as a mentor/appraiser to medical student, nurse, radiographer or colleague Formalisation of interest in teaching – PgCert, Diploma (Optional) | CiPs 3, 5, 6 |

11. Breast radiology

11.1 Core breast radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire basic clinical, pathological and radiological understanding of breast disease with reference to common presentations | |
| Understand anatomy and physiology of breast, changes with age and patterns of disease spread | CiP 8 |
| Understand the physics of image production and how it affects image quality with respect to mammography, ultrasound & breast MRI | CiP 10 |
| Understand the principles of differentiation between normal breast, benign and malignant disease | CiP 8 |
| Understand clinical presentation, pathogenesis and basic principles of treatment of breast disease | CiPs 8, 12 |
| Understand indications for and determine optimal imaging examination | CiP 7 |
| Understand basic principles underlying population screening and assessment of screen detected abnormalities | CiPs 2, 8, 12 |
| Awareness of local/national guidelines | CiPs 4, 7, 12 |
| Interpret mammograms to recognize normal anatomy and discriminate between benign and malignant imaging findings | CiP 8 |
| Perform breast ultrasound to: discriminate cystic v solid mass; recognise typical features of benign and malignant masses; identify and discriminate between normal and abnormal axillary lymph nodes. | CiPs 8, 9 |
| Intervention: Perform image guided cyst aspiration, abscess drainage, fine needle aspiration and core biopsy under supervision | CiP 9 |
| Intervention: Observe breast stereotactic biopsy, vacuum assisted biopsy (VAB), localisation under ultrasound and radiographic guidance and axillary node biopsy | CiP 9 |
| Observe breast MRI reporting | CiP 8 |
| Apply/adhere to local/regional/national guidelines | CiPs 2, 4, 7, 12 |
| Observe and reflect on MDT working | CiPs 6, 12 |
| Communicate sensitively and appropriately with patients | CiPs 1, 9 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Involve seniors appropriately | CiPs 1, 6, 8, 9 |
| Tailor examination to clinical indication | CiP 7 |
| Communicate results rapidly | CiPs 1, 8 |
| Obtain informed consent where appropriate | CiPs 1, 9 |
| Prioritise workload to respond to the most urgent cases first | CiP 9 |
| Recognise the need for timely specialist opinion from other clinicians/radiologists | CiPs 6, 12 |

11.2 Level 1 breast radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of breast disease with reference to presentations and common diagnoses to a level where a definitive report can be produced for common clinical presentations | |
| Understand technical aspects of mammography, ultrasound and MRI related to breast imaging | CiP 7 |
| Understand the principles of population screening including potential harms and benefits and equality of access | CiP 2 |
| Understand principles underlying quality assurance of a screening programme | CiP 2 |
| Understand principles of risk, common risk factors and their relation to screening | CiP 2 |
| Understand principles of ranges of treatment of breast cancer and their impact/dependence on imaging | CiPs 4, 7, 12 |
| Understand role of prognostic factors in breast cancer treatment and follow-up | CiP 12 |
| Understand principles of evaluation of tumour response to treatment and role of different modalities: mammography, ultrasound and MRI | CiPs 7, 8 |
| Understanding of standards for MDTM | CiPs 2, 12 |
| Knowledge of range of established imaging studies relevant to breast imaging and their role. Awareness of novel techniques | CiPs 4, 7 |
| Knowledge of staging for breast malignancy including indications and appropriate techniques | CiP 7 |
| Understand the principles of breaking bad news – see Good Clinical Care B2 | CiP 1 |
| Report symptomatic mammograms | CiP 8 |
| Recognise radiological features of mammographic abnormalities found in population screening & surveillance | CiP 8 |
| Be involved in triple assessment clinics | CiPs 6, 7, 8, 9 |
| Perform breast and axillary ultrasound in the assessment of symptomatic breast disease | CiPs 8, 9 |
| Perform Interventions of breast and axilla under ultrasound and stereotaxis: FNA /core/ vacuum biopsy/localisations/ drainages | CiPs 8, 9 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Recognise atypical appearances of common conditions | CiP 8 |
| Recognise/seek clinical and radiological information which advances diagnosis | CiPs 4, 8 |
| Recognise clinical priority of certain presentations | CiPs 4, 9 |
| Recognise how diagnosis affects management pathway | CiPs 6, 8, 12 |
| Seek additional clinical information relevant to case | CiPs 4, 6, 12 |
| Initiate additional examination/investigation as appropriate | CiP 7 |
| Participate in MDTs | CiP 12 |
| Perform reflective learning from clinical practice, audit and where relevant, registry data | CiP 3 |
| Take part in teaching and training | CiP 5 |
| Demonstrate a highly organised work pattern | CiPs 1, 2, 3, 6 |
| Show openness to critical feedback of reports | CiPs 1, 3 |
| Appreciate the importance of keeping up to date with clinical developments and with relevant safety issues | CiPs 3, 4 |
| Be available and able to discuss cases with clinical colleagues | CiPs 6, 12 |
| Work in close cooperation with wider MDTs | CiPs 6, 12 |
| Be involved in communicating malignant results to patients in accordance with local practice | CiPs 1, 9 |

11.3 Level 2 breast radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of breast disease with reference to presentations and uncommon diagnoses to a level where a definitive report can be produced for the great majority of clinical presentations | |
| Detailed knowledge of breast anatomy and variants | CiP 8 |
| Link presentation with likely diagnoses | CiP 8 |
| National guidelines and current literature | CiP 4 |
| Understand structure & management of National Breast Screening Programme | CiP 2 |
| Understand principles of evidence-based practice with respect to screening, treatment and evaluation of novel treatment | CiPs 2, 3, 4 |
| Attended National Breast Screening Training Centre course | CiPs 2, 3, 4 |
| Undertake staging according to national/local guidelines | CiP 8 |
| Report Breast MR | CiP 8 |
| Report digital breast tomosynthesis | CiP 8 |
| Observe MR guided breast biopsy | CiP 9 |
| Take part in PERFORMS | CiPs 3, 8 |
| Evaluate tumour response | CiP 8 |
| Evaluate breast prosthesis integrity | CiP 8 |
| Provide expert opinion on appropriate patient imaging | CiPs 6, 8, 12 |
| Provide expert image interpretation | CiP 8 |
| Be able accurately to report broad case mix | CiP 8 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Write clear succinct reports which emphasise the key findings and diagnoses | CiP 8 |
| Read 5000 screening mammograms a year with audit of reading performance | CiPs 2, 3, 8 |
| Automatically prioritise cases according to clinical need | CiP 9 |
| Be able to discuss complex cases with referring clinicians and colleagues | CiPs 6, 12 |
| Be able to relate clinical and imaging findings succinctly | CiP 8 |
| Undertake an active role in service delivery | CiPs 6, 7, 8, 9, 12 |
| Assume a leadership role in multidisciplinary meetings | CiPs 6, 12 |
| Offer timely specialist opinion | CiPs 6, 8 |
| Discuss with specialist centre appropriately | CiPs 6, 12 |
| Participate in regional professional QA meetings | CiPs 2, 3, 4 |
| Be involved in breast imaging research | CiPs 3, 4 |
| Be able to communicate malignant results to patient and discuss likely treatment | CiPs 1, 3, 4, 6, 12 |

12. Cardiac radiology

12.1 Core cardiac radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire basic clinical, pathological and radiological understanding of cardiac and cardiovascular disease with reference to common presentations | |
| Knowledge of anatomy and physiology relevant to clinical practice | CiP 8 |
| Understand pathology associated with common presentations and link with likely primary and differential diagnoses | CiPs 7, 8, Table 1 |
| Understand basic technique and limitations of common cardiac investigations (e.g. radiography, CT, MRI, nuclear, echocardiography, angiography) | CiPs 7, 8, Table 1 |
| Knowledge of local/national guidelines in relation to common presentations | CiPs 2, 12 |
| Construct appropriate imaging pathway considering different pathologies and management options, and according to available resource and case complexity. | CiPs 2, 7 Table 1 |
| Radiographic interpretation and reporting with awareness of limitations | CiP 8 |
| Basic cardiac CT and MR interpretation and reporting for common presentations and incidental findings | CiP 8, Table 1 |
| Intervention – No specific requirement | Table 1 |
| Apply/adhere to local/regional/national guidelines | CiPs 2, 4, 7, 12 |
| Observe and reflect on MDT working | CiPs 3, 12 |
| Communicate sensitively and appropriately with patients | CiPs 1, 8 |
| Involve seniors appropriately | CiPs 1, 6, 11 |
| Tailor examination to clinical indication | CiP 7 |
| Communicate results rapidly | CiP 8 |
| Obtain informed consent where appropriate | CiPs 1, 4, 9, 11 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Prioritise workload to respond to the most urgent cases first | CiP 9 |
| Recognise the need for timely specialist opinion from other clinicians/radiologists | CiPs 1, 9, 11 |

12.2 Level 1 cardiac radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of cardiac and cardiovascular disease with reference to presentations and common diagnoses to a level where a definitive report can be produced for common clinical presentations | |
| Understand atypical presentations of common conditions | CiPs 7, 8, Table 1 |
| Link presentation with likely diagnoses | CiPs 7, 8, Table 1 |
| Relevant cardiac anatomy and physiology | CiP 8 |
| Awareness of the range of specialised and non-specialised cardiac imaging techniques | CiP 7 |
| Local/national guidelines in relation to presentations | CiPs 7, 12 |
| Familiarity with more specialised imaging techniques (CT coronary calcium scoring, CT coronary angiography, Basic Echocardiography, Cardiac MRI, cardiac nuclear studies) including knowledge of limitations and common artefacts | CiP 7, Table 1 |
| Understand indication, technique, risks and limitations of stress studies | CiPs 7, 9 |
| Require minimal supervision with most cases | CiPs 1, 6 |
| Recognise atypical appearances of common conditions | CiPs 7, 8, Table 1 |
| Recognise/seek clinical and radiological information which advances diagnosis | CiPs 7, 8 |
| Undertake Basic Echocardiographic USS (Optional) | Table 1 |
| Interpret and report cardiac CT (including coronary calcium scoring and CT coronary angiography), cardiac MRI and cardiac nuclear medicine studies | CiP 8, Table 1, 2 |
| Interpret and report Stress studies | CiPs 8, 9, Table 1 |
| Intervention- (Optional) Drainage of Pericardial Effusions | CiP 11, Table 1 |
| Seek additional clinical information relevant to case | CiP 6 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Initiate additional examination/investigation as appropriate | CiP 7 |
| Participate in MDTs | CiPs 1, 12 |
| Perform reflective learning from clinical practice, audit and where relevant, registry data | CiP 3 |
| Take part in teaching and training | CiP 5 |
| Demonstrate a highly organised work pattern | CiPs 1, 2, 6, 8, 9 |
| Show openness to critical feedback of reports | CiPs 1, 3 |
| Appreciate the importance of keeping up to date with clinical developments and with relevant safety issues | CiPs 3, 4 |
| Be available and able to discuss cases with clinical colleagues | CiPs 1, 6, 7, 8, 12 |

12.3 Level 2 cardiac radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of cardiac and cardiovascular disease with reference to uncommon presentations and diagnoses to a level where a definitive report can be produced for the great majority of clinical presentations | |
| Detailed understanding of cardiac and vascular anatomy and variants | CiP 8 |
| Recognition of uncommon conditions mimicking common diagnoses | CiPs 7, 8, Table 1 |
| Understanding of anatomy of congenital cardiac disease | CiP 8 |
| Detailed understanding of National guidelines and current literature | CiPs 4, 12 |
| Understanding of the complete range of cardiac imaging | CiP 7, Table 1 |
| Understand the requirements of cardiovascular imaging prior to interventional procedures e.g. prior to transcatheter aortic valve implantation (TAVI) | CiP 7, Table 1 |
| Advanced cardiac ultrasound e.g. stress & non-stress echocardiography (optional) | Table 1 |
| Interpret and report specialist CT/MR e.g. complex congenital heart disease, TAVI | CiP 8 |
| PET-CT of cardiac disease including malignancy | CiPs 7, 8, Table 1, 2 |
| Provide expert opinion and interpretation on appropriate patient imaging | CiPs 1, 6, 8, 12 |
| Intervention- (Optional) Coronary angioplasty & stenting, ablative therapies, intravascular ultrasound (IVUS) | Table 1 |
| Write clear succinct reports which emphasise the key findings and diagnoses | CiP 8 |
| Automatically prioritise cases according to clinical need | CiP 9 |
| Be able to discuss complex cases with referring clinicians and colleagues | CiPs 1, 6, 7, 8, 12 |
| Be able to relate clinical and imaging findings succinctly | CiP 8, Table 1 |
| Undertake an active role in service delivery | CiPs 2, 7, 8, 9, 10, 11, 12 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Assume a leadership role in multidisciplinary meetings | CiPs 1, 6, 12 |
| Offer timely specialist opinion | CiPs 6, 8 |
| Discuss with specialist centre appropriately | CiP 6 |

13. Emergency radiology

13.1 Core emergency radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire basic clinical, pathological and radiological understanding of emergency disease with reference to common presentations and diagnoses | |
| Understand clinical significance of pathology associated with emergency presentation and link with likely diagnoses | CiPs 8, 9, 11 |
| Applied anatomy to interpret emergency imaging | CiPs 8, 9, 11 |
| Understand the role of radiology in the acute setting | CiPs 7, 8, 9, 11 |
| Local/regional guidelines in relation to presentations | CiPs 2, 12 |
| Determine optimal imaging examination | CiP 7 |
| Radiographic interpretation and limitations | CiPs 7, 8, 10, |
| Perform and interpret contrast studies – swallows, single contrast enemas, urethrograms, cystograms (in trauma setting) | CiPs 7, 8, 9, |
| Basic abdominal ultrasound | CiPs 7, 8, 9 |
| Basic CT/MRI interpretation and report presentations | CiPs 7, 8, 9 |
| Intervention – see General and non vascular intervention | CiPs 7, 8, 9, 11 |
| Apply/adhere to local/regional/national guidelines | CiPs 1, 2, 12 |
| Observe and reflect on MDT working | CiPs 3, 6, 12 |
| Communicate sensitively and appropriately with patients | CiPs 1, 4, 7, 8, 9, 11 |
| Involve seniors appropriately | CiPs 1, 3, 6, 8, 9, 11, 12 |
| Tailor examination to clinical indication | CiPs 7, 8, 9, 11 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Communicate results rapidly | CiPs 1, 6, 8, 9, 11 |
| Obtain informed consent where appropriate | CiPs 1, 9, 11 |
| Prioritise workload to respond to the most urgent cases first | CiPs 1, 8, 9, 11 |
| Recognise the need for timely specialist opinion from other clinicians/radiologists | CiPs 1, 6, 7, 8, 9, 11, 12 |

13.2 Level 1 emergency radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of emergency disease with reference to presentations and common diagnoses to a level where a definitive report can be produced for common clinical presentations | |
| Recognises atypical presentations of common conditions | CiPs 8, 9, 11 |
| Requires minimal supervision with most cases | CiPs 7, 8, 9, 11 |
| Recognises atypical appearances of common conditions | CiPs 8, 9, 11 |
| Recognises / seeks clinical and radiological information which advances diagnosis | CiPs 7, 8, 9, 10, 11 |
| Recognises clinical priority of certain presentations | CiPs 7, 8, 9, 11 |
| Recognises how diagnosis affects management pathway | CiPs 7, 8, 9, 11 |
| Seek additional clinical information relevant to case | CiPs 1, 6, 7 |
| Initiate additional examination/investigation as appropriate | CiPs 1, 7 |
| Participate in MDTs | CiPs 6, 12 |
| Perform reflective learning from clinical practice, audit and where relevant, registry data | CiPs 3, 4 |
| Take part in teaching and training | CiPs 3, 5 |
| Demonstrate a highly organised work pattern | CiPs 1, 2 |
| Show openness to critical feedback of reports | CiPs 1, 3, 6, |
| Appreciate the importance of keeping up to date with clinical developments and with relevant safety issues | CiPs 4, 7 |
| Be available and able to discuss cases with clinical colleagues | CiPs 1, 6, 12 |

13.3 Level 2 emergency radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-------------------------------|
| To acquire detailed clinical, pathological and radiological understanding of emergency disease with reference to presentations and uncommon diagnoses to a level where a definitive report can be produced for the great majority of clinical presentations | |
| Detailed understanding of acute clinical presentations and diagnoses | CiPs 8, 9, 11 |
| Detailed knowledge of normal and variant anatomy relevant to above | CiPs 8, 9, 11 |
| Recognition of uncommon conditions mimicking common diagnoses | CiPs 8, 9, 11 |
| Provides expert opinion on appropriate patient emergent imaging | CiPs 1, 5, 6, 7, 8, 9, 11, 12 |
| Provides expert image interpretation | CiPs 8, 9, 11 |
| Able accurately to report on complete range of emergency cases | CiPs 8, 9, 11 |
| Writes clear succinct reports which emphasise the key findings and diagnoses | CiPs 8, 9, 11 |
| Automatically prioritise cases according to clinical need | CiPs 1, 7 |
| Be able to discuss complex cases with referring clinicians and colleagues | CiPs 6, 12 |
| Be able to relate clinical and imaging findings succinctly | CiPs 6, 8, 9, 11, 12 |
| Undertake an active role in service delivery | CiPs 2, 3, 4 |
| Assume a leadership role in multidisciplinary meetings | CiPs 6, 12 |
| Offer timely specialist opinion | CiPs 8, 9, 11 |
| Discuss with specialist centre appropriately | CiPs 7, 8, 9, 11, 12 |

14. Gastro-intestinal radiology

14.1 Core gastro-intestinal radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire basic clinical, pathological and radiological understanding of gastrointestinal disease with reference to common presentations | |
| Recall basic anatomy and physiology, in clinical practice relevant to imaging examinations of the: <ul style="list-style-type: none"> • gastrointestinal tract • hepatobiliary tract • pancreas | CiP 8 |
| Have observed common endoscopic procedures such as OGD and colonoscopy. Understand their indications, contraindications, strengths and weaknesses | CiP 10 |
| Common surgical procedures, expected post-operative imaging appearances and common complications | CiP 8 |
| Understand clinical significance of pathology associated with presentation and link with likely diagnoses | CiP 8 and Table 1 |
| Understand indications, contraindications and limitations of relevant specialised barium/contrast imaging examinations of the: <ul style="list-style-type: none"> • gastrointestinal tract • hepatobiliary tract | CiPs 7, 8 |
| Recall relevant indications and limitations of Ultrasound, CT and MR | CiP 7 |
| Understand indications and contraindications of relevant interventional techniques | CiPs 7, 11 |
| Construct appropriate imaging pathway considering different pathologies and management options and according to available resource and case complexities | CiP 7 |
| Report plain radiographs relevant to GI, hepatobiliary system and pancreas with awareness of limitations | CiPs 8, 9 |
| Perform and report barium and water soluble contrast examinations | CiP 9 and Table 3 |
| Performance/protocol of basic non invasive imaging; US, CT, MRI | CiP 9 |
| Write provisional interpretation/report of imaging and inform clinicians and MDTs of findings urgently, where relevant, according to local guidelines | CiPs 6, 8 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Intervention: anatomically relevant image guided biopsy and drainage | CiP 11 and Table 3 |
| Intervention : insertion of NG and NJ tubes | CiP 11 and Table 3 |
| Apply/adhere to local/regional/national guidelines | CiPs 4, 7 |
| Observe and reflect on MDT working | CiP 12 |
| Communicate sensitively and appropriately with patients | CiPs 1, 6 |
| Involve seniors appropriately | CiPs 1, 6, 11 |
| Tailor examination to clinical indication | CiP 7 |
| Communicate results rapidly | CiP 8 |
| Obtain informed consent where appropriate | CiPs 1, 11 |
| Prioritise workload to respond to the most urgent cases first | CiP 9 |
| Recognise the need for timely specialist opinion from other clinicians/radiologists | CiPs 9, 11 |

14.2 Level 1 gastro-intestinal radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of gastrointestinal disease with reference to presentations and common diagnoses to a level where a definitive report can be produced for common clinical presentations | |
| Recognise atypical presentations of common conditions | CiP 7 |
| State indications and limitations of specialist liver imaging including US contrast and liver specific MR contrast agents | CiPs 7, 8 |
| State indications and limitations of specialist GI imaging studies including ultrasound, CT and MRI | CiPs 7, 8 |
| Have observed specialist endoscopic procedures (such as ERCP, luminal stenting and EUS). Understand their indications, contraindications, strengths and weaknesses | CiP 7 |
| Require minimal supervision with most cases | CiPs 1, 6 |
| Perform and report specialised GI imaging techniques e.g. <ul style="list-style-type: none"> • CT colonography • US/CT/MR assessment of small bowel • liver specific MR contrast • contrast enhanced US | CiPs 7, 8, 9 |
| Recognise/seek clinical and radiological information which advances diagnosis | CiP 4 |
| Recognise how diagnosis affects management pathway | CiP 8 |
| Intervention (optional) – <ul style="list-style-type: none"> • cholecystostomy • PTC • gastrostomy • gastrointestinal and biliary stenting | CiP 11 and IR Curriculum |
| Develop and refine the basic fluoroscopic examinations learnt in core training | CiP 9 and Table 3 |
| Seek additional clinical information relevant to case | CiPs 4, 6 |
| Initiate additional examination/investigation as appropriate | CiP 7 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Participate in MDTs | CiPs 1, 2 |
| Perform reflective learning from clinical practice, audit and where relevant, registry data | CiP 3 |
| Take part in teaching and training | CiP 5 |
| Demonstrate a highly organised work pattern | CiPs 1, 2 |
| Show openness to critical feedback of reports | CiPs 1, 3 |
| Appreciate the importance of keeping up to date with clinical developments and with relevant safety issues | CiP 3 |
| Be available and able to discuss cases with clinical colleagues | CiP 6 |

14.3 Level 2 gastro-intestinal radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of gastrointestinal disease with reference to uncommon presentations and diagnoses to a level where a definitive report can be produced for the great majority of clinical presentations | |
| Detailed understanding of clinical presentations and diagnoses | CiP 7 |
| Detailed knowledge of normal and variant anatomy relevant to above | CiP 8 |
| Recognition of uncommon conditions mimicking common diagnoses | CiP 7 |
| Familiarity with pathology causing pelvic floor and anorectal dysfunction | CiP 7 |
| Detailed understanding of national guidelines and current literature | CiPs 4, 7 |
| Provide expert opinion on appropriate patient imaging | CiP 8 |
| Provide expert image interpretation | CiP 8 |
| Organise and undertake appropriate imaging pathways in investigating conditions | CiPs 7, 8, 9 |
| Perform relevant imaging techniques for pelvic floor and anorectal functional assessment | CiPs 7, 8, 9 |
| Optional - Perform endoscopic ultrasound for assessment of oesophageal, pancreatic, biliary and rectal tumours | CiP 11 and IR Curriculum |
| Optional - Perform optical endoscopy of the GI tract for diagnostic and therapeutic purposes, including biopsy and stenting of the GI and biliary tract | CiP 11 and IR Curriculum |
| Intervention (optional) – <ul style="list-style-type: none"> • percutaneous ablation techniques, • venous and enteral access for nutritional support • transarterial embolisation and chemoembolisation techniques • TIPSS | CiP 11 and IR Curriculum |
| Confidently perform and interpret the full range of fluoroscopic examinations of the GI tract | CiPs 7, 8, 9 and Table 3 |
| Automatically prioritise cases according to clinical need | CiP 9 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Be able to discuss complex cases with referring clinicians and colleagues | CiPs 6, 12 |
| Be able to relate clinical and imaging findings succinctly | CiP 8 |
| Undertake an active role in service delivery | CiPs 7, 8, 9, 10, 11, 12 |
| Assume a leadership role in multidisciplinary meetings | CiP 12 |
| Offer timely specialist opinion | CiPs 6, 8 |
| Discuss with specialist centre appropriately | CiPs 6, 11 |

15 General and non-vascular intervention

15.1 Level 1 general and non-vascular intervention

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of non-vascular interventional skills with reference to presentations and common diagnoses to a level where a definitive report can be produced for common clinical presentations | |
| Recall and build upon normal and post-surgical anatomy relevant to image guided intervention examinations | CiP 8, Table 1 |
| Know common acute and chronic presentation of pathologies in different organ systems and how the clinical scenario affects management strategy | CiPs 8, 13 |
| Recognise clinical sequelae of these conditions | CiPs 8, 13 |
| Recognise the medical, interventional and surgical management options for these conditions | CiPs 8, 13 |
| Understand the management of patients with contraindications to interventional procedure | CiPs 11, 13 |
| Understand nutritional assessment and support | CiPs 11, 13 |
| Knowledge of basic suturing techniques and wound care | CiPs 11,13 |
| Be aware of national IR audits and registries | CiPs 4, 13 |
| Understand the principles and practice of safe sedation | CiPs 9, 13 |
| Know how to resuscitate and initially manage an acutely unwell patient in the settings of trauma, haemorrhage or sepsis | CiP 9 |
| Perform clinical assessment of patients in ward and out-patient settings before and after interventions | CiPs 13, 14 |
| Organise and undertake appropriate imaging | CiP 7 |
| Recognise/seek clinical and radiological information which advances diagnosis | CiP 7 |
| Recognise clinical priority of certain presentations | CiPs 7, 9 |
| Recognise how diagnosis affects management pathway | CiPs 8, 11, 13, 14 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Perform acute interventions in the emergency or on call setting | CiPs 11, 14 |
| Accurately interpret and report most common conditions | CiP 8 |
| Manage patients' drains e.g. monitoring output, skin care and exchange | CiPs 13, 14 |
| Perform advanced nutritional procedures: <ul style="list-style-type: none"> • radiological insertion of gastrostomies/jejunostomies • adjustment of gastric bands | CiPs 13, 14 |
| Increase skills in imaging guided intervention using ultrasound and CT Perform: <ul style="list-style-type: none"> • nephrostomy • percutaneous transhepatic drainage, • percutaneous cholecystotomy | CiPs 13, 14 |
| Convert: <ul style="list-style-type: none"> • nephrostomy to ureteric stent • external biliary drain to internal biliary stent | CiPs 13, 14 |
| Perform basic suturing and wound care | CiPs 13, 14 |
| Recognise and manage complications of interventional procedures | CiPs 8, 11, 13, 14 |
| Organise and undertake appropriate follow up imaging | CiPs 7, 13, 14 |
| Undertake post-procedural follow-up of patients | CiPs 13, 14 |
| Formulate a plan for investigation and management | CiPs 7, 13, 14 |
| Perform safe sedation, including the assessment and management of complications of sedation | CiPs 9, 13 |
| Clinical assessment of acutely unwell patients in the setting of trauma, haemorrhage or sepsis. | CiPs 13, 14 |
| Seek additional clinical information relevant to case | CiPs 7, 13 |
| Initiate additional examination/investigation as appropriate | CiPs 7, 13 |
| Participate in MDTs | CiP 12 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Perform reflective learning from clinical practice, audit and where relevant, registry data | CiP 3 |
| Take part in teaching and training | CiP 5 |
| Demonstrate a highly organised work pattern | CiP 1 |
| Show openness to critical feedback of reports | CiP 3 |
| Appreciate the importance of keeping up to date with clinical developments and with relevant safety issues | CiPs 1, 3, 4 |
| Be available and able to discuss cases with clinical colleagues | CiPs 6, 7, 8 |
| Demonstrate good working relationships with specialist nurse/radiographer practitioners | CiPs 6, 14 |
| Record performance data in local and national registries | CiP 13 |

15.2 Level 2 general and non-vascular intervention

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of non-vascular interventional skills with reference to presentations and uncommon diagnoses to a level where a definitive report can be produced for the great majority of clinical presentations | |
| Understand in detail most acute clinical presentations and diagnoses | CiPs 8, 13 |
| Know normal and variant anatomy (post-surgical anatomy) relevant to above | CiP 8 |
| Recognise uncommon conditions | CiPs 7, 13, |
| Know the expected outcomes of different diagnostic and therapeutic options | CiPs 8, 11, 13, 14 |
| Understand the role of percutaneous tumour ablation in interventional oncology | CiPs 8, 13 |
| Be familiar with a range of interventional equipment – balloons, stents, feeding tubes | CiPs 11, 13, 14 |
| Understand the indications, contraindications and limitations of optical endoscopic examinations of the GI tract and their use in GI and biliary tract biopsy, drainage and stenting | CiPs 13 |
| Provide expert advice on appropriate patient imaging | CiP 7 |
| Provide expert image interpretation | CiP 8 |
| Perform plugged or transjugular biopsy in the presence of abnormal clotting | CiPs 11, 13 |
| Perform retroperitoneal biopsy – lymph node, pancreas | CiPs 11, 13 |
| Perform drainage of complex collections e.g. loculated collections, empyema, phlegmon | CiPs 11, 13 |
| Perform advanced procedures in the urinary tract e.g. percutaneous nephrolithotomy and pyeloplasty | CiP 13 |
| Perform advanced procedures in GI tract – balloon dilatation of strictures, stent insertion (oesophageal, duodenal, colonic) | CiP 13 |
| Perform advanced procedures in the hepatobiliary system | CiP 13 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Perform tumour ablation | CiP 13 |
| Optional - Perform endoscopic procedures of the GI tract for GI and biliary tract biopsy, drainage and stenting | CiP 13 |
| Optional - Perform endovascular procedures relevant to hepatobiliary disease: chemoembolisation, TIPSS, isotope-labelled embolisation | CiP 13 |
| Perform vertebroplasty | CiP 13 |
| Perform ablation of bone lesions | CiP 13 |
| Perform fallopian tube recanalization | CiP 13 |
| Recognise and manage unusual complications | CiP 13, 14 |
| Perform acute interventions in the emergency or on call setting | CiP 13, 14 |
| Automatically prioritise cases according to clinical need | CiPs 7, 9, 11, 13, 14 |
| Be able to discuss complex cases with referring clinicians and colleagues | CiPs 6, 7, 8, 12, 13, 14 |
| Be able to relate clinical and imaging findings succinctly | CiP 8 |
| Undertake an active role in service delivery | CiPs 2, 3 |
| Assume a leadership role in multidisciplinary meetings | CiPs 6, 12 |
| Offer timely specialist opinion | CiP 8 |
| Discuss with specialist centre appropriately | CiPs 8, 11, 13 |
| Have an active role in interventional service delivery | CiPs 2, 3, 13 |
| Be able to accept referrals for imaging and intervention | CiPs 7, 13 |

16. Head and neck radiology

16.1 Core head and neck radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|--------------------------------------|
| To acquire basic clinical, pathological and radiological understanding of head and neck disease with reference to common presentations | |
| Understand clinical significance of pathology associated with presentation and link with likely diagnoses | CiP 7 |
| Applied anatomy to interpret head and neck imaging | CiP 8 |
| Understand role of radiology in the specific clinical setting | CiP 7 |
| Local/regional guidelines in relation to presentations | CiPs 4,7 |
| Determine optimal imaging examination | CiP 7 |
| Interpretation and limitations | CiPs 8, 10 |
| Perform and interpret imaging studies – swallows | CiPs 7, 8 |
| Basic head and neck ultrasound | CiPs 8, 9 |
| Basic CT/MRI interpretation and report presentations | CiPs 7, 8 |
| Intervention – Ultrasound guided fine needle aspiration of cervical/supraclavicular lymph nodes | CiP 9 & Table 3 Practical procedures |
| Apply/adhere to local/regional/national guidelines | CiPs 4,7 |
| Observe and reflect on MDT working | CiP 12 |
| Communicate sensitively and appropriately with patients | CiPs 1, 6 |
| Involve seniors appropriately | CiPs 1, 6 |
| Tailor examination to clinical indication | CiP 7 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Communicate results rapidly | CiP 8 |
| Obtain informed consent where appropriate | 1,11 |
| Prioritise workload to respond to the most urgent cases first | CiP 9 |
| Recognise the need for timely specialist opinion from other clinicians/radiologists | CiP 6 |

16.2 Level 1 head and neck radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of head and neck disease with reference to uncommon presentations and common diagnoses to a level where a definitive report can be produced for common clinical presentations | |
| Recognise atypical presentations of common conditions | CiP 7 |
| Require minimal supervision with most cases | CiPs 1, 6 |
| Recognise/seek clinical and radiological information which advances diagnosis | CiP 4 |
| Recognise clinical priority of certain presentations | CiPs 4,9 |
| Recognise how diagnosis affects management pathway | CiP 8 |
| Intervention – FNA/core biopsy | CiP 9 & Table 3 |
| Seek additional clinical information relevant to case | CiPs 4, 6 |
| Initiate additional examination/investigation as appropriate | CiP 7 |
| Participate in MDTs | CiP 12 |
| Perform reflective learning from clinical practice, audit and where relevant, registry data | CiP 3 |
| Take part in teaching and training | CiP 5 |
| Demonstrate a highly organised work pattern | CiPs 1, 2 |
| Show openness to critical feedback of reports | CiPs 1, 3 |
| Appreciate the importance of keeping up to date with clinical developments and with relevant safety issues | CiP 3 |
| Be available and able to discuss cases with clinical colleagues | CiP 6 |

16.3 Level 2 head and neck radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of head and neck disease with reference to uncommon diagnoses to a level where a definitive report can be produced for the great majority of clinical presentations | |
| Detailed understanding of clinical presentations and diagnoses | CiP 7 |
| Detailed knowledge of normal and variant anatomy relevant to above | CiP 8 |
| Familiarity with scintigraphy and PET/CT | CiPs 7, 8 |
| Recognition of uncommon conditions mimicking common diagnoses | CiP 7 |
| Provide expert opinion on appropriate patient imaging | CiP 8 |
| Perform sialography and videofluoroscopy | CiP 9 |
| Provide expert image interpretation | CiP 8 |
| Be able accurately to report most cases | CiP 8 |
| Write clear succinct reports which emphasise the key findings and diagnoses | CiP 8 |
| Intervention –advanced biopsy techniques | CiP 9 & Table 3 |
| Automatically prioritise cases according to clinical need | CiP 9 |
| Be able to discuss complex cases with referring clinicians and colleagues | CiPs 6, 12 |
| Be able to relate clinical and imaging findings succinctly | CiP 8 |
| Undertake an active role in service delivery | CiPs 7, 8, 9 |
| Assume a leadership role in multidisciplinary meetings | CiP 12 |
| Offer timely specialist opinion | CiPs 6, 8 |
| Discuss with specialist centre appropriately | CiP 6 |

17. Molecular imaging

17.1 Core molecular imaging

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To acquire a fundamental clinical, pathological, cell biological and radiological understanding of a wide range of molecular imaging investigations with reference to common presentations | |
| Basic knowledge of the spectrum of techniques utilised in Functional and Molecular Imaging: Radionuclide radiology; Functional MRI; Contrast Enhanced CT; US – bubble contrast; Optical imaging – fluorescent & bioluminescent imaging; Hybrid imaging - SPECT-CT, PET-CT, PET-MRI & other hybrid technologies | CiP 8 & Table 2 |
| Knowledge of the basics of probe design in MI | CiP 8 & Table 2 |
| Basic knowledge of the biological processes in disease that can be probed with Functional and Molecular Imaging including: Inflammation and immune response; Tumour formation and proliferation; Extracellular environment alteration; Metabolism; Infection; Vascular remodelling and angiogenesis; Hypoxia; Thrombosis; Cell stress and death; Degenerative processes; Tissue repair | CiP 8 & Table 2 |
| Recommend the appropriate use of these techniques in different clinical scenarios: PET-CT, diffusion weighted MRI, CT perfusion, micro-bubble ultrasound | CiP 7 |
| Basic interpretation of PET CT | CiP 8 |
| Basic interpretation of Diffusion Weighted Imaging (DWI) of the head | CiP 8 |
| Apply/adhere to local/regional/national guidelines | CiPs 4, 7 |
| Observe and reflect on MDT working | CiP 12 |
| Communicate sensitively and appropriately with patients | CiPs 1, 6 |
| Involve seniors appropriately | CiPs 1, 6 |
| Tailor examination to clinical indication | CiP 7 |
| Communicate results rapidly | CiP 8 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Obtain informed consent where appropriate | CiPs 1, 11 |
| Prioritise workload to respond to the most urgent cases first | CiP 9 |
| Recognise the need for timely specialist opinion from other clinicians/radiologists | CiP 6 |

17.2 Level 1 molecular imaging

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| <p>To acquire a more detailed clinical, pathological, cell biological and radiological understanding of a wide range of molecular imaging investigations with reference to presentations and common diagnoses, to a level where a definitive report can be produced for common clinical presentations.</p> <p>Evaluate and present molecular imaging investigations across the curriculum.</p> <p>Option to complement other system based expertise.</p> | |
| <p>Knowledge of the biology of disease related to imaging including: Basic cell, tissue and organ structure and function; DNA, RNA, proteins, metabolites, saccharides, glycerides, complex molecules; Growth, division and replication; Death (apoptosis, necrosis, necroptosis); Basic biological processes in health and disease; Specific biological processes that can be probed using imaging</p> | CiP 8 & Table 2 |
| <p>Knowledge of cell structure and function: DNA, RNA, proteins, metabolites, saccharides, glycerides, complex molecules; Transcription, translation, post-translational modifications, protein folding; Receptors, transporters, enzymes, organelles</p> | CiP 8 & Table 2 |
| <p>Knowledge of organ and tissue structure and function: Extracellular environment; vascularity</p> | CiP 8 & Table 2 |
| <p>Knowledge of biological processes in health and disease Growth, division and replication; Movement and migration; Death (apoptosis, necrosis, necroptosis); Inter- and intra-cellular signalling; Metabolism and respiration</p> | CiP 8 & Table 2 |
| <p>Knowledge of bioinformatics Genomics; proteomics; metabolomics; biological networks; radiomics</p> | CiP 8 & Table 2 |
| <p>Knowledge of specific biological processes that can be probed imaging Hypoxia; vascularity; proliferation; cell death</p> | CiP 8 & Table 2 |
| <p>Knowledge of transgenes and reporter genes</p> | CiP 8 & Table 2 |
| <p>Detailed knowledge of and application of the spectrum of techniques utilised in Functional and Molecular Imaging</p> | CiP 8 & Table 2 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| <p>The principles of radionuclide radiology:</p> <ul style="list-style-type: none"> • PET <ul style="list-style-type: none"> • 18F-labelled tracers • FDG-PET • Non FDG-PET tracers • Non 18F-labelled tracers • SPECT • molecular radiotherapy | CiP 8 & Table 2 |
| <p>MRI</p> <ul style="list-style-type: none"> • the principles of MRI • diffusion weighted imaging • dynamic contrast-enhanced MRI • spectroscopy • other methods: magnetisation transfer, CEST, hyperpolarisation | CiP 8 & Table 2 |
| <p>CT</p> <ul style="list-style-type: none"> • the principles of CT • dynamic contrast-enhanced CT (CT perfusion) | CiP 8 & Table 2 |
| <p>US</p> <ul style="list-style-type: none"> • the principles of US • bubble-contrast US | CiP 8 & Table 2 |
| <p>Optical imaging</p> <ul style="list-style-type: none"> • bioluminescence • fluorescence Imaging • Raman spectroscopy (optional) • photo-acoustic imaging (optional) | CiP 8 & Table 2 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| <p>Basic chemistry of probe design in MI</p> <ul style="list-style-type: none"> • the principles of target, probe and label • signal amplification • cell labelling • labelling processes in: <ul style="list-style-type: none"> • radionuclide radiology • MR • US • optical imaging | CiP 8 & Table 2 |
| <p>Knowledge of the biological processes across the whole spectrum of disease that can be probed with Functional and Molecular Imaging</p> | CiP 8 & Table 2 |
| <p>Knowledge of role of Molecular Imaging and Therapy</p> <ul style="list-style-type: none"> • radionuclide therapy • pharmacokinetics, pharmacodynamics and imaging • imaging and drug trials • theranostics; combining imaging and therapy e.g. drug delivery • gene therapy and viral vectors • stem cell therapy • personalised medicine | CiP 8 & Table 2 |
| <p>Knowledge of research methods in imaging</p> <ul style="list-style-type: none"> • the principles of in vitro imaging • the principles of in vivo pre-clinical imaging • the principles of human imaging and clinical trials • regulatory procedures in clinical trials <ul style="list-style-type: none"> • GCP GMP IMP MHRA IRAS Ethical approval ARSAC • signal processing • data modelling • co-registration • image analysis methods • statistical approaches for imaging • role of site supervisor, CI, PI, • RECIST principles • funding processes/grant applications | CiP 4 & Table 2 |
| <p>Determine optimal imaging examination</p> | CiP 7 |
| <p>Construct imaging pathway in relation to diagnostic/management options for molecular imaging</p> | CiP 7 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Performance/protocol of basic Molecular imaging; radionuclide radiology, US, CT, MRI, hybrid imaging | CiP 7 |
| Be able accurately to report most cases and emphasise the key findings and diagnoses | CiP 8 |
| Recognise clinical priority of certain presentations | CiP 9 |
| Recognise how diagnosis affects management pathway | CiP 7 |
| Seek additional clinical information relevant to case | CiPs 4, 6 |
| Initiate additional examination/investigation as appropriate | CiP 7 |
| Participate in MDTs | CiP 12 |
| Perform reflective learning from clinical practice, audit and where relevant, registry data | CiP 3 |
| Take part in teaching and training | CiP 5 |
| Demonstrate a highly organised work pattern | CiPs 1, 2 |
| Show openness to critical feedback of reports | CiPs 1, 3 |
| Appreciate the importance of keeping up to date with clinical developments and with relevant safety issues | CiP 3 |
| Be available and able to discuss cases with clinical colleagues | CiP 6 |

17.3 Level 2 molecular imaging

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of Molecular Imaging in diagnosis and management of disease with reference to common and uncommon presentations and diagnoses to a level where a definitive report can be produced for the great majority of clinical presentations | |
| Detailed understanding of molecular and cell biology | CiP 8 & Table 2 |
| Detailed knowledge of the use of a specific molecular imaging technique in one or more modalities in relation to diagnosis and therapy | CiPs 7, 8 & Table 2 |
| Recognition of uncommon conditions | CiPs 7, 8 |
| Detailed knowledge of research methodology including <ul style="list-style-type: none"> • current research organisation in UK; NCRI, NHRI, Cancer UK, BIDD • integrated Research Application System • regulatory authorities; MHRA, ARSAC, animal modelling • principles of translational research • comprehensive Research Networks function, structure and funding • basic statistics including Monte-Carlo transformations • IMB, Investigational Medicinal Brochures – structure • IMP – Investigational Medicinal Products – regulations • Ethics Committee – function and composition | CiP 4 |
| Provide expert opinion on appropriate patient imaging | CiP 8 |
| Provide expert image interpretation | CiP 8 |
| Utilisation of molecular imaging techniques for diagnosis, prognosis, treatment and monitoring of disease | CiP 7, 9 |
| Specific procedural skills in at least one area of molecular imaging - radionuclide radiology, US, CT, MRI, hybrid imaging | CiP 7, 9 |
| Demonstrates ability to design a clinical trial/research project | CiPs 1, 2, 4 |
| Completion of GCP accreditation | CiP 4 |
| Demonstrates ability to submit a grant application | CiP 4 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Demonstrates ability to analyse data | CiPs 4, 7 |
| Present at local/national/international meetings | CiP 4 |
| Demonstrates ability to critically evaluate other projects | CiPs 4, 7 |
| Automatically prioritise cases according to clinical need | CiP 9 |
| Be able to discuss complex cases with referring clinicians and colleagues | CiPs 6, 12 |
| Be able to relate clinical and imaging findings succinctly | CiP 8 |
| Undertake an active role in service delivery | CiPs 7, 8, 9 |
| Assume a leadership role in multidisciplinary meetings | CiP 12 |
| Offer timely specialist opinion | CiPs 6, 8 |
| Discuss with specialist centre appropriately | CiP 6 |
| Enter performance data into local and national registries | CiP 3 |

18. Musculoskeletal radiology

18.1 Core musculoskeletal radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire basic clinical, pathological and radiological understanding of musculoskeletal disease with reference to common presentations | |
| Applied anatomy relevant to musculoskeletal disease and radiological diagnosis | CiP 8 |
| Terminology relevant to MSK imaging | CiPs 7, 8 |
| Role of different imaging modalities in MSK | CiPs 7, 9 |
| Principles of bone and joint lesion characterisation | CiP 7 |
| Awareness of tumour staging | CiP 8 |
| Local/regional guidelines in relation to MSK presentations | CiPs 4, 7, 12 |
| Link presentations with likely diagnoses | CiP 7 |
| Determine optimal imaging examination | CiP 7 |
| Radiographic interpretation and limitations | CiPs 7, 8 |
| Perform basic MSK ultrasound e.g. common tendon injuries and joint effusions | CiPs 7, 8, 9 |
| Basic MSK CT interpretation and report for core presentations and diagnoses | CiPs 7, 8 |
| Basic MSK MRI interpretation and report for core presentation | CiPs 7, 8 |
| Basic plain film interpretation with respect to rheumatology and trauma | CiPs 7, 8 |
| Decision making in relation to initial patient management | CiP 8 |
| Intervention - US guided fluid aspiration | CiP 9 |
| Apply/adhere to local/regional/national guidelines | CiPs 4, 7, 12 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Observe and reflect on MDT working | CiP 6 |
| Communicate sensitively and appropriately with patients | CiP 1 |
| Involve seniors appropriately | CiPs 1, 6 |
| Tailor examination to clinical indication | CiP 7 |
| Communicate results rapidly | CiP 8 |
| Obtain informed consent where appropriate | CiPs 1, 11 |
| Prioritise workload to respond to the most urgent cases first | CiP 9 |
| Recognise the need for timely specialist opinion from other clinicians/radiologists | CiP 6 |

18.2 Level 1 musculoskeletal radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of musculoskeletal disease with reference to presentations and common diagnoses to a level where a definitive report can be produced for common clinical presentations | |
| Recognise all/atypical presentations of common conditions | CiP 7 |
| Awareness of appropriate investigations in relation to MSK malignancy | CiP 7 |
| Role of arthrography | CiP 7 |
| Require minimal supervision with most cases | CiP 8 |
| Protocol & interpret MSK MRI | CiPs 7, 8, 9 |
| Recognise atypical appearances of common conditions | CiP 7 |
| Perform MSK ultrasound of joints, muscles, tendons and soft tissue masses | CiP 8 |
| Specialist CT & MRI including arthrography | CiPs 7, 8 |
| Recognise clinical priority of MSK presentations | CiP 8 |
| Recognise how diagnosis affects management pathway | CiPs 7, 8 |
| Refer appropriately to previous imaging | CiPs 7, 8 |
| Intervention: <ul style="list-style-type: none"> • arthrography • therapeutic joint and soft tissue injections • aspiration and drainage procedures • bone and soft tissue biopsy (if recommended by specialist centre) • basic spinal techniques | CiP 9 |
| Intervention – Recognise and manage complications of biopsy | CiP 9 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Seek additional clinical information relevant to case | CiPs 4, 6 |
| Initiate additional examination/investigation as appropriate | CiP 7 |
| Participate in MDTs | CiP 12 |
| Perform reflective learning from clinical practice, audit and where relevant, registry data | CiP 3 |
| Take part in teaching and training | CiP 5 |
| Demonstrate a highly organised work pattern | CiPs 1, 2 |
| Show openness to critical feedback of reports | CiPs 1, 3 |
| Appreciate the importance of keeping up to date with clinical developments and with relevant safety issues | CiP 3 |
| Be available and able to discuss cases with clinical colleagues | CiP 6 |

18.3 Level 2 musculoskeletal radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of musculoskeletal disease with reference to uncommon presentations and diagnoses to a level where a definitive report can be produced for the great majority of clinical presentations | |
| Detailed knowledge of normal and variant anatomy relevant to MSK | CiP 8 |
| National/international guidelines and current literature | CiPs 4, 7, 12 |
| Recognition of uncommon conditions mimicking common diagnoses | CiP 7 |
| Recognition of typical appearances of uncommon conditions | CiP 7 |
| Interpret & perform complex MRI / CT | CiP 8 |
| Provide expert opinion on appropriate patient imaging | CiP 8 |
| Provide expert image interpretation | CiP 8 |
| Be able accurately to report most cases | CiP 8 |
| Write clear succinct reports which emphasise the key findings and diagnoses | CiP 8 |
| Intervention - Complex spinal interventional techniques | CiP 11 |
| Automatically prioritise cases according to clinical need | CiP 9 |
| Be able to discuss complex cases with referring clinicians and colleagues | CiPs 6, 12 |
| Be able to relate clinical and imaging findings succinctly | CiP 8 |
| Undertake an active role in service delivery | CiPs 7, 8, 9 |
| Assume a leadership role in multidisciplinary meetings | CiP 12 |
| Offer timely specialist opinion | CiPs 6, 8 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Discuss with specialist centre appropriately | CiP 6 |

19. Neuroradiology

19.1 Core neuroradiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire basic clinical, pathological and radiological understanding of diseases of the brain and spine with reference to common presentations | |
| Applied anatomy relevant to cranial and spinal imaging examinations | CiP 8 |
| Know the common causes of acute cranial pathology and their management | CiPs 7, 8 |
| Know the common causes of acute spinal pathology and their management | CiPs 7, 8 |
| Interpret basic CT and MRI of the head | CiP 8 |
| Basic interpretation of Diffusion Weighted Imaging (DWI) of the head | CiP 8 |
| Understand the imaging pathway in relation to intracranial pathology | CiP 7 |
| Give a definitive report for straightforward cases and a provisional report for more complex findings | CiP 8 |
| Interpret radiographs, basic CT and MRI of the spine | CiP 8 |
| Understand the imaging pathway in relation to acute spinal pathology | CiP 7 |
| Apply/adhere to local/regional/national guidelines | CiPs 4, 7 |
| Observe and reflect on MDT working | CiP 12 |
| Communicate sensitively and appropriately with patients | CiPs 1, 6 |
| Involve seniors appropriately | CiPs 1, 6 |
| Tailor examination to clinical indication | CiP 7 |
| Communicate results rapidly | CiP 8 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Obtain informed consent where appropriate | CiPs 1, 11 |
| Prioritise workload to respond to the most urgent cases first | CiP 9 |
| Recognise the need for timely specialist opinion from other clinicians/radiologists | CiP 6 |

19.2 Level 1 neuroradiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of diseases of the brain and spine with reference to presentations and common diagnoses to a level where a definitive report can be produced for common clinical presentations | |
| Detailed applied anatomy relevant to cranial and spinal imaging examinations | CiP 7 |
| Know a wide range of intracranial pathologies, their imaging and clinical management | CiP 8 |
| Know a wide range of spinal pathologies, their imaging and clinical management | CiP 8 |
| Interpret MRI examination | CiP 8 |
| Recognise/seek clinical and radiological information which advances diagnosis | CiP 6 |
| Recognise clinical priority of certain presentations | CiP 9 |
| Recognise how diagnosis affects management pathway | CiP 9 |
| Provide a definitive report on neuroaxis CT and MRI | CiP 8 |
| Supervise more complex examinations (e.g. CTA) | CiP 5 |
| Perform biopsy of straightforward spinal lesions. | CiP 11 |
| Formulate a management plan | CiP 11 |
| Seek additional clinical information relevant to case | CiPs 4, 6 |
| Initiate additional examination/investigation as appropriate | CiP 7 |
| Participate in MDTs | CiP 12 |
| Perform reflective learning from clinical practice, audit and where relevant, registry data | CiP 3 |
| Take part in teaching and training | CiP 5 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Demonstrate a highly organised work pattern | CiPs 1, 2 |
| Show openness to critical feedback of reports | CiPs 1, 3 |
| Appreciate the importance of keeping up to date with clinical developments and with relevant safety issues | CiP 3 |
| Be available and able to discuss cases with clinical colleagues | CiP 6 |

19.3 Level 2 neuroradiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of diseases of the brain and spine with reference to presentations and uncommon diagnoses (Table ND) to a level where a definitive report can be produced for the great majority of clinical presentations | |
| Identify the full range of intracranial and spinal pathologies | CiPs 7, 8 |
| Outline the full clinical management of neurological and neurosurgical cranial and spinal conditions. | CiPs 8, 9 |
| Knowledge of range of imaging studies relevant to neuroradiology and their role e.g. radionuclide studies, PET – CT, perfusion imaging, MR spectroscopy, myelography, cerebral and spinal angiography | CiPs 7, 8 |
| Provide expert opinion on appropriate patient imaging | CiPs 8, 9 |
| Report and undertake more complex examinations | CiPs 8, 9 |
| Provide expert opinion on appropriate patient imaging | CiP 7 |
| Provide expert image interpretation | CiP 8 |
| Take part in teaching and training at local and national level | CiP 5 |
| Automatically prioritise cases according to clinical need | CiP 9 |
| Be able to discuss complex cases with referring clinicians and colleagues | CiP 6 |
| Be able to relate clinical and imaging findings succinctly | CiP 8 |
| Undertake an active role in service delivery | CiPs 7, 8, 9 |
| Assume a leadership role in multidisciplinary meetings | CiP 12 |
| Offer timely specialist opinion | CiPs 6, 8 |
| Discuss with specialist centre appropriately | CiP 6 |

20. Oncological radiology

20.1 Core oncological radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire basic clinical, pathological and radiological understanding of oncological disease with reference to common presentations | |
| Applied anatomy to interpret oncology imaging | CiPs 8, 9, 11 |
| State typical pathways of spread of common tumours | CiPs 8, 12 |
| Recall the common tumour staging nomenclature | CiPs 8, 12 |
| Recall the application of imaging modalities in oncological practice | CiPs 7, 8, 9, 11, 12 |
| State the most common radiological manifestations of complications of cancer treatments | CiPs 8, 12 |
| Local/regional guidelines in relation to cancer imaging | CiPs 2, 12 |
| Awareness of TNM staging | CiPs 8, 12 |
| Determine optimal imaging examination relevant to oncology | CiPs 7, 10 |
| Radiographic interpretation and limitations in cancer imaging | CiPs 7, 8, 10 |
| Perform and interpret pertinent staging and follow-up examinations of common tumours | CiPs 8, 12 |
| Ultrasound in cancer patients | CiPs 9 |
| CT/MRI interpretation and reporting in common cancer presentations | CiP 8 |
| Basic PET/CT interpretation | CiP 8 |
| Perform image-guided biopsy of readily accessible tumours | CiPs 9, 11 |
| Apply/adhere to local/regional/national guidelines | CiPs 1, 2, 12 |
| Observe and reflect on MDT working | CiPs 3, 6, 12 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Communicate sensitively and appropriately with patients | CiPs 1,4, 7, 8, 9, 11 |
| Involve seniors appropriately | CiPs 1, 3, 6, 8, 9, 11, 12 |
| Tailor examination to clinical indication | CiPs 7, 8, 9, 11 |
| Communicate results rapidly | CiPs 1, 6, 8, 9, 11 |
| Obtain informed consent where appropriate | CiPs 1, 9, 11 |
| Prioritise workload to respond to the most urgent cases first | CiPs 1, 8, 9, 11 |
| Recognise the need for timely specialist opinion from other clinicians/radiologists | CiPs 1, 6, 7, 8, 9, 11, 12 |

20.2 Level 1 oncological radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of oncological disease with reference to presentations and common diagnoses to a level where a definitive report can be produced for common clinical presentations | |
| State atypical presentations of common tumours | CiPs 8, 9, 11, 12 |
| State pathways of spread of less common tumours | CiPs 8, 9, 11, 12 |
| State patient factors and imaging features associated with increased morbidity and mortality | CiPs 8, 12 |
| State the indications for advanced imaging techniques (e.g. Contrast US, MRS, DWI, Specific MR contrast agents and radionuclide radiology and PET/CT) in cancer imaging | CiPs 7, 8, 9, 11, 12 |
| State less common radiological manifestations of complications of treatment of cancer | CiPs 8, 12 |
| Working knowledge of TNM staging | CiPs 8, 12 |
| Local/regional guidelines | CiPs 1, 2, 4, 7, 8, 12 |
| Recall the epidemiological aspects of common tumours | CiP 4 |
| Recognise atypical appearances of common cancers | CiPs 8, 9, 11 |
| Recognise/seek clinical and radiological information which advances diagnosis | CiPs 7, 8, 9, 10, 11 |
| Recognise clinical priority of certain presentations | CiPs 7, 8, 9, 11 |
| Recognise how diagnosis affects management pathway | CiPs 7, 8, 9, 11 |
| Supervise and interpret follow-up examinations of less common tumours | CiPs 5, 8, 9, 11 |
| Apply response assessment techniques | CiP 7 |
| Intervention – Perform technically difficult targeted image-guided biopsy of neoplastic lesions | CiPs 9, 11 |
| Intervention – Participate in a range of interventional cancer therapies | CiPs 9, 11 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Seek additional clinical information relevant to case | CiPs 1, 6, 7 |
| Initiate additional examination/investigation as appropriate | CiPs 1, 7 |
| Participate in MDTs | CiPs 6, 12 |
| Perform reflective learning from clinical practice, audit and where relevant, registry data | CiPs 3, 4 |
| Take part in teaching and training | CiPs 3, 5 |
| Demonstrate a highly organised work pattern | CiPs 1, 2 |
| Show openness to critical feedback of reports | CiPs 1, 3, 6, |
| Appreciate the importance of keeping up to date with clinical developments and with relevant safety issues | CiPs 4, 7 |
| Be available and able to discuss cases with clinical colleagues | CiPs 1, 6, 12 |
| Recognise National Guidelines e.g. NICE, SIGN | CiPs 1, 2, 12 |

20.3 Level 2 oncological radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of oncological disease with reference to uncommon presentations and diagnoses to a level where a definitive report can be produced for the great majority of clinical presentations | |
| Detailed understanding of most clinical presentations and diagnoses | CiPs 7, 8, 9, 11, 12 |
| Detailed knowledge of normal and variant anatomy relevant to above | CiPs 8, 9, 11 |
| Recognition of uncommon conditions mimicking common diagnoses | CiPs 7, 8, 9, 11, 12 |
| Recall the detailed staging classification for different tumour types | CiPs 8, 12 |
| Working knowledge of advanced specialist imaging investigations for particular tumour types (see level 1) | CiPs 7, 8, 12 |
| State a comprehensive range of the radiological manifestations of complications of treatment of cancer and approaches to their management | CiPs 8, 12 |
| State the epidemiological aspects of tumours | CiP 4 |
| State national guidelines and current literature | CiPs 1, 2, 4, 8, 12 |
| Provide expert opinion on appropriate patient imaging | CiPs 7, 12 |
| Provide expert image interpretation | CiPs 8, 9, 11 |
| Write clear succinct reports which emphasise the key findings and diagnoses, relevant prognostic and management details | CiPs 8, 9, 11 |
| Report specialist imaging examinations (e.g. Perfusion studies, MRS, DWI, PET/CT (including SUV)) | CiP 8 |
| Support Clinical Oncologists in radiotherapy planning | CiPs 8, 6, 12 |
| Intervention – Perform technically difficult targeted image-guided biopsy of neoplastic lesions | CiPs 9, 11 |
| Intervention – Undertake advanced interventional cancer therapies e.g. embolisation +/- chemo, RFA | CiPs 11 |
| Apply detailed knowledge of response assessment techniques including RECIST, irRC | CiPs 8, 12 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Automatically prioritise cases according to clinical need | CiPs 1, 7 |
| Be able to discuss complex cases with referring clinicians and colleagues | CiPs 6, 12 |
| Be able to relate clinical and imaging findings succinctly | CiPs 6, 8, 9, 11, 12 |
| Undertake an active role in service delivery | CiPs 2, 3, 4 |
| Assume a leadership role in multidisciplinary meetings | CiPs 6, 12 |
| Offer timely specialist opinion | CiPs 8, 9, 11 |
| Discuss with specialist centre appropriately | CiPs 7, 8, 9, 11, 12 |
| Engage in research; active involvement in Oncology Trials | CiP 4 |

21. Paediatric radiology

21.1 Core paediatric radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire basic clinical, pathological and radiological understanding of paediatric diseases with reference to common presentations | |
| Understand clinical significance of pathology associated with presentation and link with likely diagnoses | CiP 7 |
| Applied anatomy and physiology to interpret paediatric imaging | CiP 8 |
| Understand role of radiology in the specific clinical paediatric setting | CiP 7 |
| Local/regional/national guidelines in relation to presentations | CiPs 4, 7 |
| Determine optimal imaging examination | CiP 7 |
| Radiographic interpretation and limitations | CiPs 8, 10 |
| Perform and interpret contrast imaging studies | CiPs 7, 8 |
| Basic abdominal ultrasound | CiPs 8, 9 |
| Basic CT and MRI in paediatric practice | CiPs 7, 8 |
| Apply/adhere to local/regional/national guidelines | CiPs 4, 7 |
| Observe and reflect on MDT working | CiP 12 |
| Communicate sensitively and appropriately with patients | CiPs 1, 6 |
| Involve seniors appropriately | CiPs 1, 6 |
| Tailor examination to clinical indication | CiP 7 |
| Communicate results rapidly | CiP 8 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Obtain informed consent where appropriate | CiPs 1, 11 |
| Prioritise workload to respond to the most urgent cases first | CiP 9 |
| Recognise the need for timely specialist opinion from other clinicians/radiologists | CiP 6 |

21.2 Level 1 paediatric radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of paediatric diseases with reference to presentations and common diagnoses to a level where a definitive report can be produced for common clinical presentations | |
| Recognise atypical presentations of common conditions | CiP 7 |
| Require minimal supervision with most cases | CiPs 1, 6 |
| Recognise atypical appearances of common conditions | CiP 7 |
| Recognise/seek clinical and radiological information which advances diagnosis | CiP 4 |
| Recognise clinical priority of certain presentations | CiPs 4, 9 |
| Recognise how diagnosis affects management pathway | CiP 8 |
| Basic paediatric CT/MRI supervision and reporting | CiPs 7, 8, 9 |
| Seek additional clinical information relevant to case | CiPs 4, 6 |
| Initiate additional examination/investigation as appropriate | CiP 7 |
| Participate in MDTs | CiP 12 |
| Perform reflective learning from clinical practice, audit and where relevant, registry data | CiP 3 |
| Take part in teaching and training | CiP 5 |
| Demonstrate a highly organised work pattern | CiPs 1, 2 |
| Show openness to critical feedback of reports | CiPs 1, 3 |
| Appreciate the importance of keeping up to date with clinical developments and with relevant safety issues | CiP 3 |
| Be available and able to discuss cases with clinical colleagues | CiP 6 |

21.3 Level 2 paediatric radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of paediatric diseases with reference to uncommon presentations and diagnoses to a level where a definitive report can be produced for the great majority of clinical presentations | |
| Detailed understanding of most clinical presentations and diagnoses | CiP 7 |
| Detailed knowledge of normal and variant anatomy relevant to above | CiP 8 |
| Recognition of uncommon conditions mimicking common diagnoses | CiP 7 |
| Provide expert opinion on appropriate patient imaging | CiP 8 |
| Provide expert image interpretation | CiP 8 |
| Be able accurately to report most cases | CiP 8 |
| Write clear succinct reports which emphasise the key findings and diagnoses | CiP 8 |
| Intervention – see General and non vascular intervention | CiP 11 |
| Intervention – reduction of intussusception | CiP 11 |
| Automatically prioritise cases according to clinical need | CiP 9 |
| Be able to discuss complex cases with referring clinicians and colleagues | CiPs 6, 12 |
| Be able to relate clinical and imaging findings succinctly | CiP 8 |
| Undertake an active role in service delivery | CiPs 7, 8, 9 |
| Assume a leadership role in multidisciplinary meetings | CiP 12 |
| Offer timely specialist opinion | CiPs 6, 8 |
| Discuss with specialist centre appropriately | CiP 6 |

22. Radionuclide radiology

22.1 Core radionuclide radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To acquire basic clinical, pathological and radiological understanding of radionuclide imaging with reference to common presentations. | |
| Basic science – for physics and mathematics refer to First FRCR curriculum | CiP 8, 10, FRCR 1 |
| Role of common radiopharmaceuticals currently available | CiP 9 |
| Understand the principles and indications of commonly performed radionuclide studies and relation to other imaging investigations (refer to specific systems) | CiP 8 & Tables 1, 2 |
| Describe patient preparation, precautions and complications of commonly performed investigations | CiP 9, 11 |
| Role of hybrid technologies such as SPECT CT and PET CT | Table 2 |
| Demonstrate the ability to translate regulatory framework into local practice | CiP 2, 3 |
| Safe handling of radiopharmaceuticals | CiP 9 |
| Interpretation of normal and abnormal results of commonly performed investigations across all clinical systems | CiP 8 |
| Apply the basic science and cellular biology appropriate to radionuclide radiology and PET CT | CiP 8, 10 & table 2 |
| Be able to integrate and correlate basic radionuclide radiology investigations with other imaging modalities | CiP 7 |
| Practise the safe handling of radiopharmaceuticals for self and others | CiP 9 |
| Apply/adhere to local/regional/national guidelines | CiPs 2, 4, 7 |
| Observe and reflect on MDT working | CiP 6, 12 |
| Communicate sensitively and appropriately with patients | CiPs 1, 6, 9 |
| Involve seniors appropriately | CiPs 1, 6, 9 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Tailor examination to clinical indication | CiP 7 |
| Communicate results rapidly | CiP 8 |
| Obtain informed consent where appropriate | CiPs 1,9, 11 |
| Prioritise workload to respond to the most urgent cases first | CiP 9 |
| Recognise the need for timely specialist opinion from other clinicians/radiologists | CiP 6, 9 |

22.2 Level 1 radionuclide radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-------------------------------|
| <p>To acquire a fundamental clinical, pathological and radiological understanding of a wide range of radionuclide investigations with reference to presentations and common diagnoses, to a level where a definitive report can be produced for common clinical presentations.</p> <p>Independent reporting of bone, lung and renal imaging.</p> <p>Evaluate and present complex investigations such as PET-CT and SPECT /CT across the curriculum.</p> <p>Option to complement other system based expertise.</p> | |
| <p>Basic science</p> <p>Basic statistics; Quantitative imaging and basic modelling; Radiation dose from radiopharmaceuticals; Management of radiation accidents relating to radionuclide radiology; Principles of Quality Assurance</p> | CiPs 3, 8, 10, FRCR 1 |
| <p>Regulatory framework</p> <p>Appreciation of legislative frameworks</p> | CiP 2, 10, FRCR 1 |
| <p>Clinical Application for each system</p> <p>Appropriate anatomy, physiology, pathophysiology and biochemistry of system under investigation; Indication for specific radiotracers including sensitivity and specificity; Role of comparative imaging tests; Radiation protection issues for each choice of tracer; Role of PET CT in staging of malignancies</p> | CiP 8, 9 & Tables1, 2, FRCR 1 |
| <p>System specific knowledge – CNS</p> <p>Radiopharmaceuticals for use in CNS imaging, e.g. cerebral metabolism, cerebral perfusion, neuroreceptor imaging and cerebral amyloid</p> | CiP 8 & Tables1, 2 |
| <p>System specific knowledge – Endocrine</p> <p>Adrenal, Thyroid and Parathyroid imaging and uptake measurements where appropriate</p> | CiP 8 & Tables1, 2 |
| <p>System specific knowledge – Gastrointestinal</p> <p>Include salivary gland imaging, gastrointestinal transit studies, gastrointestinal blood loss, Meckel's diverticulum imaging, hepatic and hepatobiliary studies</p> | CiP 8 & Tables1, 2 |
| <p>System specific knowledge – Infection and Inflammation</p> <p>Basic science of infection/inflammation including cellular mechanisms; Clinical spectrum of occult sepsis</p> | CiP 8 & Tables1, 2 |
| <p>System specific knowledge – Lymphoscintigraphy</p> <p>Lymphoedema evaluation and sentinel node localisation; mechanisms of tumour spread and concept of the sentinel node</p> | CiP 8 & Tables1, 2 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| System specific knowledge – Oncology Imaging tumour sites using radionuclide techniques including introductory PETCT & Hybrid imaging | CiP 8 & Tables1, 2 |
| System specific knowledge – Ophthalmic System Nasolacrimal drainage | CiP 8 & Tables1, 2 |
| System specific knowledge – Paediatrics Imaging children using radionuclides; Understand the growth and maturation in children with special reference to the handling of radiotracers by immature organs; Specific indications in children especially of the renal tract, biliary tract and skeleton | CiP 8 & Tables1, 2 |
| System specific knowledge – Pulmonary System Pulmonary embolism, regional ventilation, mucociliary and small solute clearance; Clinical risk factors and presentation of PE; Indications for and evidence base supporting ventilation perfusion imaging; Contribution of D-dimer measurements and leg Doppler studies and role of CTPA; Clinical features and management of obstructive pulmonary disease, bronchiectasis and alveolitis and relation to imaging | CiP 8 & Tables1, 2 |
| System specific knowledge – Skeletal System Bone and bone marrow scans | CiP 8 & Tables1, 2 |
| System specific knowledge – Urogenital System Renal and bladder function | CiP 8 & Tables1, 2 |
| System specific knowledge – Cardiovascular System Myocardial perfusion imaging, infarct imaging and radionuclide ventriculography; Principles of myocardial perfusion and SPECT imaging | CiP 8 & Tables1, 2 |
| PET CT – Basic Science Theory of production and decay of positron radionuclides used in Clinical PET CT; Dosimetry of the various tracers used; SUV quantification, variables and errors associated with quantitative measurements; Physiology and patient preparation; fasting, diabetes, use of sedation | CiP 8, 10 & Table 2 |
| PET CT – Oncology Normal and physiological variation in tracer distribution and overlap with benign conditions that are FDG avid; Effect of chemotherapy and radiotherapy; Role in tumour diagnosis, staging and recurrence; Response assessment; Role with respect to comparative imaging | CiP 8 & Table 2 |
| PET CT – Non-Oncology Role in non-malignant condition e.g. infection, inflammation and vasculitis | CiP 8 & Table 2 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Molecular and functional imaging Relationship between modalities such as MR, Spectroscopy, DNA probes etc.. | CiP 8 & Table 2 |
| Basic Science Practical experience with monitoring devices, probes, dose calibrators, gamma cameras and positron emission tomography systems; Safe handling and administration of radiopharmaceuticals; Practical management of radioactive contamination; Aseptic technique; Comply with current regulations | CiPs 8, 9 & Table 2, FRCR 1 |
| Clinical Application Preparation of patient prior to the test; Choice of radiopharmaceutical; Radiotracer preparation and its quality assurance; Measurement and drawing up of tracer; Radiopharmaceutical injection; Audit outcome of studies; Review of sequential data on patients and comparison with other methods of assessments | CiPs 7, 9 & Table 2 |
| System Specific Skills – Lymphoscintigraphy Surface localisation of the sentinel node; Calibration and use of the hand help probe | CiP 8 & Tables1, 2 |
| System Specific Skills – Cardiovascular System Setting up of instrumentation prior to ECG-gating and SPECT acquisition; Perform physiological or pharmacological stress prior to myocardial perfusion studies; Techniques of tomographic reconstruction, qualitative and quantitative analysis | CiP 8 & Tables1, 2 |
| System Specific Skills- PET-CT Image interpretation and reporting including normal variants, artefacts, sources of error and assessment of utility; Audit outcome of studies; Review of sequential data on patients and comparison with other methods of assessment | CiP 8 & Tables1, 2 |
| Seek additional clinical information relevant to case | CiPs 4, 6, 7 |
| Initiate additional examination/investigation as appropriate | CiPs 7, 8 |
| Participate in MDTs | CiP 12 |
| Perform reflective learning from clinical practice, audit and where relevant, registry data | CiP 3 |
| Take part in teaching and training | CiP 5 |
| Demonstrate a highly organised work pattern | CiPs 1, 2 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Show openness to critical feedback of reports | CiPs 1, 3 |
| Appreciate the importance of keeping up to date with clinical developments and with relevant safety issues | CiP 3 |
| Be available and able to discuss cases with clinical colleagues | CiPs 6, 8, 9, 12 |

22.3 Level 2 radionuclide radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of radionuclide imaging with reference to presentations and common diagnoses to a level where a definitive report can be produced for the great majority of clinical presentations | |
| Basic science Parametric and non-parametric statistics; Modelling tracer kinetics and quantitative imaging; Calculation of radiation dose from radiopharmaceuticals (effective dose); Management of radiation accidents relating to radionuclide radiology; Physicochemical and biological properties of less common radiopharmaceuticals and those under development; Cell labelling techniques; Principles of Quality Assurance in the radiopharmacy; Quality control parameters determining the quality of radiopharmaceuticals including radionuclide and radiochemical purity | CiP 8 & Table 2 |
| Regulatory Frameworks Understanding of UK regulatory frameworks relating to practice of radionuclide radiology | CiP 2, FRCR 1 |
| Clinical Application for each system Appropriate anatomy, physiology, pathophysiology and biochemistry of system under investigation; Indication for specific radiotracers including sensitivity and specificity; Role of comparative imaging tests; Radiation protection issues for each choice of tracer; Role of PET CT in staging of malignancies | CiP 8 & Table 2 |
| System specific knowledge – CNS Radiopharmaceuticals for use in CNS imaging, e.g. cerebral metabolism, cerebral perfusion, neuroreceptor imaging and cerebral amyloid | CiP 8 & Tables1, 2 |
| System specific knowledge – Endocrine Adrenal, Thyroid and Parathyroid imaging and uptake measurements where appropriate; Clinical presentation of thyroid disease; Role of complementary investigations including thyroid biochemistry and immunology; Imaging of neuroendocrine tumours with in depth knowledge of somatostatin receptor imaging, other tracers and in combination with CT and MRI | CiP 8 & Tables1, 2 |
| System specific knowledge – Gastrointestinal Include salivary gland imaging, gastro-oesophageal reflux, gastrointestinal transit studies, gastrointestinal blood loss, Meckel's diverticulum imaging, hepatic, hepatobiliary and splenic function assessment; Imaging of inflammatory bowel disease; Bile salt malabsorption-SeHCAAT | CiP 8 & Tables1, 2 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| <p>System specific knowledge – Infection and Inflammation</p> <p>Basic science of infection/inflammation including cellular mechanisms; Clinical spectrum of occult sepsis</p> | CiP 8 & Tables1, 2 |
| <p>System specific knowledge – Lymphoscintigraphy</p> <p>Lymphoedema evaluation and Sentinel node localisation; Mechanisms of tumour spread and concept of the sentinel node; Familiar with hybrid imaging techniques</p> | CiP 8 & Tables1, 2 |
| <p>System specific knowledge – Oncology</p> <p>Imaging tumour sites using radionuclide techniques, including PET- CT; Role in diagnosis, staging, localisation, therapy and monitoring response to treatment; Role in relation to other imaging techniques</p> | CiP 8 & Tables1, 2 |
| <p>System specific knowledge – Ophthalmic System</p> <p>Nasolacrimal drainage</p> | CiP 8 & Tables1, 2 |
| <p>System specific knowledge – Paediatrics</p> <p>Imaging children using radionuclides; Understand the growth and maturation in children with special reference to the handling of radiotracers by immature organs; Specific indications in children especially of the renal tract, biliary tract and skeleton; Knowledge of statutory issues relating to children (e.g. Children’s Act); Principles of consent in children</p> | CiP 8 & Tables1, 2 |
| <p>System specific knowledge – Pulmonary System</p> <p>Pulmonary embolism, regional ventilation, mucociliary and small solute clearance; Clinical risk factors and presentation of PE; Indications for and evidence base supporting ventilation perfusion imaging; Contribution of other diagnostic tests and imaging techniques, including D-dimer measurements, leg Doppler studies and role of CTPA; Role of radionuclide studies in the management of obstructive pulmonary disease, bronchiectasis and alveolitis</p> | CiP 8 & Tables1, 2 |
| <p>System specific knowledge – Skeletal System</p> <p>Bone and bone marrow scans</p> | CiP 8 & Tables1, 2 |
| <p>System specific knowledge – Urogenital System</p> <p>Renal and bladder function; Renography for renovascular disease and role of other imaging studies; Role of radionuclide studies in investigation of paediatric UTI, reflux and correlation with other imaging studies</p> | CiP 8 & Tables1, 2 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| <p>System specific knowledge - Cardiovascular System</p> <p>Myocardial perfusion imaging, infarct imaging and radionuclide ventriculography; Principles of myocardial perfusion and SPECT imaging; Imaging protocol used to evaluate myocardial viability, ischaemia and function; Role of other diagnostic tests and imaging studies relevant to cardiology</p> | CiP 8 & Tables1, 2 |
| <p>PET CT – Basic Science</p> <p>Theory of production and decay of positron radionuclides used in Clinical PET and PET CT; Compartment analysis methods; Appropriate mathematics and physics applied to PET tracer theory, modelling of tracer kinetics and quantitative imaging; Radiopharmacy of the tracers used in PET; Physiological principles of the techniques; Dosimetry of the various tracers used</p> <p>Legal aspects associated with tracers; Methods of measurement of tracer activity and imaging equipment required; SUV quantification, variables and errors associated with quantitative measurements; Understand equipment and dedicated PET and PET CT systems; Method of acquiring PET and PET CT images; Cyclotron physics; Physiology and patient preparation; fasting, diabetes, use of sedation</p> | CiP 8, 10 & Table 2, FRCR 1 |
| <p>PET CT – Role in Oncology</p> <p>Basic science of tumour metabolism; Normal and physiological variation in tracer distribution and overlap with benign conditions producing FDG or other PET tracer uptake; PET tracers used for tumour detection; Effect of chemotherapy and radiotherapy; Role in tumour diagnosis, staging, disease response assessment and recurrence; Role with respect to comparative imaging; Role with respect to advanced tumour characterisation: hypoxia, angiogenesis, apoptosis</p> | CiP 8 & Table 2 |
| <p>PET CT – Role in Neuropsychiatry</p> <p>Normal variation of PET tracers within the brain; Role in the diagnosis of common brain disorders such as epilepsy and dementia; Role in the evaluation of brain tumours; Role with respect to comparative imaging</p> | CiP 8 & Table 2 |
| <p>PET CT – Role in Cardiology</p> <p>FDG PET for assessment of myocardial viability; Assessment of myocardial ischaemia using other PET tracers; e.g. Rb – 82, N-13 ammonia, O-15 water</p> <p>Principles of pharmacological stress tests; Control and monitoring of glucose metabolism for FDG injection; Role with respect to comparative imaging</p> | CiP 8 & Table 2 |
| <p>Functional and Molecular Imaging</p> <p>Relationship of radionuclide imaging to other functional imaging techniques e.g. functional MRI, spectroscopy, perfusion imaging and diffusion weighted imaging</p> | CiP 8 & Table 2 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| <p>Basic Science</p> <p>Practical experience with monitoring devices, probes, dose calibrators, gamma cameras and positron emission tomography systems; Safe handling and administration of radiopharmaceuticals; Demonstrate ability to handle incidents of radioactive spillage or contamination; Show attention to detail in handling radiopharmaceuticals, ensuring purity and aseptic technique</p> | CiPs 8, 9 & Table 2 |
| <p>Clinical Application</p> <p>Preparation of patient prior to the test; Choice of radiopharmaceutical; Radiotracer preparation and its quality assurance; Measurement and drawing up of tracer; Radiopharmaceutical injection; Choice of protocols; Be familiar with setting up of instrumentation, choice of collimator and performance of scan; Be familiar with data processing, image reconstruction, quantification and image display; Image interpretation and reporting (including PET CT) including normal variants, artefacts, sources of error and assessment of utility. Audit outcome of studies; Review of sequential data on patients and comparison with other methods of assessments</p> | CiPs 7, 9 & Table 2 |
| <p>System Specific Skills – Endocrine</p> <p>Clinical examination of the thyroid; Correlation of the scan and clinical findings</p> | CiP 8 & Tables 1, 2 |
| <p>System Specific Skills – Lymphoscintigraphy</p> <p>Surface localisation of the sentinel node; Calibration and use of the hand held probe</p> | CiP 8 & Tables 1, 2 |
| <p>System Specific Skills – Cardiovascular System</p> <p>Setting up of instrumentation prior to ECG-gating and SPECT acquisition; Perform physiological or pharmacological stress prior to myocardial perfusion studies; Familiar with techniques of tomographic reconstruction, filter selection and qualitative and quantitative analysis</p> | CiP 8 & Tables 1, 2 |
| <p>Role of PET CT</p> <p>Preparation of patient prior to the test; Choice of radiopharmaceutical; Measurement and drawing up of tracer; Radiopharmaceutical injection; Setting up of instrumentation, choice of collimator and performance of scan; Data processing, image reconstruction, quantification and image display; Image interpretation and reporting (including PET CT) including normal variants, artefacts, sources of error and assessment of utility; Audit outcome of studies; Review of sequential data on patients and comparison with other methods of assessments</p> | CiP 8 & Table 2 |
| <p>Automatically prioritise cases according to clinical need</p> | CiP 9 |
| <p>Be able to discuss complex cases with referring clinicians and colleagues</p> | CiPs 6, 12 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Be able to relate clinical and imaging findings succinctly | CiP 8 |
| Undertake an active role in service delivery | CiPs 7, 8, 9 |
| Assume a leadership role in multidisciplinary meetings | CiP 12 |
| Offer timely specialist opinion | CiPs 6, 8 |
| Discuss with specialist centre appropriately | CiP 6 |

23. Thoracic radiology

23.1 Core thoracic radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire basic clinical, pathological and radiological understanding of thoracic disease with reference to common presentations | |
| Applied anatomy relevant to thoracic disease and radiological diagnosis including the pulmonary lobule | CiP 8 |
| Understanding of the imaging algorithms for common pulmonary diseases and their rationale: <ul style="list-style-type: none"> • management of the solitary pulmonary nodule (Fleischner Society Guidelines 2005) • investigation of suspected pulmonary embolism; investigation of suspected lung cancer | CiP 7,12 |
| Role of Chest Radiograph | CiP 7, Table 1 |
| Role of CT | CiP 7, Table 1 |
| Role of PET-CT | CiP 7, Table 1,2 |
| Terminology relevant to thoracic imaging (Fleischner Society Glossary 2008) | CiPs 8,12 |
| Appearance and positioning of lines, tubes and devices | CiP 8 |
| Techniques and subsequent imaging appearances of thoracic surgery | CiP 8, Table 1 |
| Local/regional guidelines in relation to clinical presentations | CiPs 2,12 |
| Determine optimal imaging examination taking account of clinical indication and implications | CiP 7, Table 1 |
| Chest radiographic interpretation and limitations | CiP 8, Table 1 |
| Basic HRCT interpretation | CiP 8, Table 1 |
| Construct reasoned and succinct differential diagnoses | CiP 8 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|--------------------------------|
| Identify and characterise basic signs of thoracic disease: collapse, consolidation, lung cancer, pneumothorax, pleural vs. parenchymal disease on CXR and CT | CiP 8, Table 1 |
| Diagnosis of PE on V/Q and CT | CiP 8, Table 1, 2 |
| US of the chest and thoracic inlet, for the diagnosis of pleural fluid versus collapse or consolidation, pneumothorax and diaphragmatic weakness and paralysis | CiPs 8, 9 |
| Intervention: <ul style="list-style-type: none"> • image guided pleural drainage • fine needle aspiration of cervical/supraclavicular lymph nodes | CiP 11, Table 1, IR curriculum |
| Apply/adhere to local/regional/national guidelines | CiPs 2, 4, 7, 12 |
| Observe and reflect on MDT working | CiPs 3, 12 |
| Communicate sensitively and appropriately with patients | CiPs 1, 8 |
| Involve seniors appropriately | CiPs 1, 6, 11 |
| Tailor examination to clinical indication | CiP 7 |
| Communicate results rapidly | CiP 8 |
| Obtain informed consent where appropriate | CiPs 1, 4, 9, 11 |
| Prioritise workload to respond to the most urgent cases first | CiP 9 |
| Recognise the need for timely specialist opinion from other clinicians/radiologists | CiP 1, 9, 11 |

23.2 Level 1 thoracic radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of thoracic disease with reference to presentations and common diagnoses to a level where a definitive report can be produced for common clinical presentations | |
| Detailed knowledge of normal and variant anatomy relevant to thoracic disease | CiP 8 |
| Recognise atypical presentations of common conditions | CiPs 7, 8, Table 1 |
| Role of MRI | CiP 7, Table 1 |
| Role of EBUS/EUS | CiPs 7, 12, Table 1 |
| Role of airway stenting | CiPs 7, 12, Table 1 |
| Protocol & interpret thoracic MRI | CiPs 7, 8, Table 1 |
| Recognise atypical appearances of common conditions | CiP 8, Table 1 |
| Recognise/seek clinical and radiological information which advances diagnosis | CiP 7, 8 |
| Diagnose lung diseases on HRCT | CiP 8, Table 1 |
| Recognise how diagnosis affects management pathway | CiPs 8, 12 |
| Clear and accurate consent for thoracic procedures | CiPs 1, 9, 11 |
| Accurate use of TNM staging in lung cancer | CiPs 8, 12 |
| Intervention – US and CT guided lung and pleural biopsy | CiP 11, Table 1 |
| Intervention – Recognise and manage complications of biopsy | CiP 11 |
| Seek additional clinical information relevant to case | CiP 6 |
| Initiate additional examination/investigation as appropriate | CiP 7 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Participate in MDTs | CiPs 1, 12 |
| Perform reflective learning from clinical practice, audit and where relevant, registry data | CiP 3 |
| Take part in teaching and training | CiP 5 |
| Demonstrate a highly organised work pattern | CiPs 1, 2, 6, 8, 9 |
| Show openness to critical feedback of reports | CiPs 1, 3 |
| Appreciate the importance of keeping up to date with clinical developments and with relevant safety issues | CiPs 3, 4 |
| Be available and able to discuss cases with clinical colleagues | CiPs 1, 6, 7, 8, 12 |

23.3 Level 2 thoracic radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|--------------------------------|
| To acquire detailed clinical, pathological and radiological understanding of thoracic disease with reference to uncommon presentations and diagnoses to a level where a definitive report can be produced for the great majority of clinical presentations | |
| Epidemiology of lung diseases | CiP 8 |
| Lung cancer screening | CiPs 2, 4, 7 |
| National/international guidelines and current literature | CiPs 4, 12 |
| Recognition of uncommon conditions mimicking common presentations/diagnoses | CiPs 7, 8 |
| Knowledge of pathology of diffuse lung disease | CiP 8 |
| Have a basic understanding of treatment options for lung cancer including: | |
| the role of surgical resection, chemoradiotherapy and ablative techniques | CiPs 8,12 |
| Report PET-CT (optional) | CiP 8, Table 1,2 |
| Provide expert opinion on appropriate patient imaging | CiPs 1, 6, 8, 12 |
| Provide expert image interpretation | CiPs 1, 6, 8, 12 |
| Demonstrate an understanding of the role of clinical/radiological/pathological integration in the diagnosis of interstitial lung disease | CiPs 6, 8, 12 |
| Intervention –More challenging lung and mediastinal biopsy | CiP 11, Table 1, IR curriculum |
| Intervention – Radiofrequency ablation (optional) | CiP 11, Table 1, IR curriculum |
| Automatically prioritise cases according to clinical need | CiP 9 |
| Be able to discuss complex cases with referring clinicians and colleagues | CiPs 1, 6, 7, 8, 12 |
| Be able to relate clinical and imaging findings succinctly | CiP 8, Table 1 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Undertake an active role in service delivery | CiPs 2, 7, 8, 9, 10, 11, 12 |
| Assume a leadership role in multidisciplinary meetings | CiPs 1, 6, 12 |
| Offer timely specialist opinion | CiPs 6, 8 |
| Discuss with specialist centre appropriately | CiP 6 |

24. Uro-gynaecological radiology

24.1 Core uro-gynaecological radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire basic clinical, pathological and radiological understanding of urogynaecological disease with reference to common presentations | |
| Understand clinical significance of pathology associated with presentation and link with likely diagnoses | CiPs 8, 9, 11 |
| Know applied anatomy to interpret urogynaecological imaging | CiPs 8, 9, 11 |
| Understand role of radiology in the specific clinical setting | CiPs 7, 8, 9, 11 |
| Know local/regional guidelines in relation to presentations | CiPs 2, 12 |
| Determine optimal imaging examination and know limitations of study | CiPs 7 |
| Radiographic interpretation | CiPs 7, 8, 10 |
| Perform and interpret imaging studies | CiPs 8, 9, 11 |
| Perform and report abdominal and pelvic ultrasound of common presentations | CiP 9 |
| Interpret and report CT/MRI studies of common presentations | CiP 8 |
| Intervention – see General and non-vascular intervention | CiPs 9, 11 |
| Apply/adhere to local/regional/national guidelines | CiPs 1, 2, 12 |
| Observe and reflect on MDT working | CiPs 3, 6, 12 |
| Communicate sensitively and appropriately with patients | CiPs 1, 4, 7, 8, 9, 11 |
| Involve seniors appropriately | CiPs 1, 3, 6, 8, 9, 11, 12 |
| Tailor examination to clinical indication | CiPs 7, 8, 9, 11 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Communicate results rapidly | CiPs 1, 6, 8, 9, 11 |
| Obtain informed consent where appropriate | CiPs 1, 9, 11 |
| Prioritise workload to respond to the most urgent cases first | CiPs 1, 8, 9, 11 |
| Recognise the need for timely specialist opinion from other clinicians/radiologists | CiPs 1, 6, 7, 8, 9, 11, 12 |

24.2 Level 1 uro-gynaecological radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of urogynaecological disease with reference to presentations and common diagnoses to a level where a definitive report can be produced for common clinical presentations | |
| Recognise typical and variant presentations of common conditions | CiPs 8, 9, 11 |
| Intervention – see General and non-vascular intervention | CiPs 9, 11 |
| Require minimal supervision with most cases | CiPs 7, 8, 9, 11 |
| Recognise/seek clinical and radiological information which advances diagnosis | CiPs 7, 8, 9, 10, 11 |
| Recognise clinical priority of certain presentations | CiPs 7, 8, 9, 11 |
| Recognise how diagnosis affects management pathway | CiPs 7, 8, 9, 11 |
| Intervention – see General and non-vascular intervention | CiPs 9, 11 |
| Seek additional clinical information relevant to case | CiPs 1, 6, 7 |
| Initiate additional examination/investigation as appropriate | CiPs 1, 7 |
| Participate in MDTs | CiPs 6, 12 |
| Perform reflective learning from clinical practice, audit and where relevant, registry data | CiPs 3, 4 |
| Take part in teaching and training | CiPs 3, 5 |
| Demonstrate a highly organised work pattern | CiPs 1, 2 |
| Show openness to critical feedback of reports | CiPs 1, 3, 6, |
| Appreciate the importance of keeping up to date with clinical developments and with relevant safety issues | CiPs 4, 7 |
| Be available and able to discuss cases with clinical colleagues | CiPs 1, 6, 12 |

24.3 Level 2 uro-gynaecological radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-------------------------------|
| To acquire detailed clinical, pathological and radiological understanding of urogynaecological disease with reference to presentations and uncommon diagnoses to a level where a definitive report can be produced for the great majority of clinical presentations | |
| Detailed understanding of most clinical presentations and diagnoses | CiPs 7, 8, 9, 11 |
| Detailed knowledge of normal and variant anatomy relevant to above | CiPs 8, 9, 11 |
| Recognition of uncommon conditions | CiPs 7, 8, 9, 11 |
| An awareness of common post-operative complications and how to image them (particularly CT) to best demonstrate conditions such as pseudoaneurysm post partial nephrectomy or ureteroileal leak post-radical cystectomy | CiPs 8, 9, 11 |
| Provide expert advice on most appropriate patient imaging | CiPs 1, 5, 6, 7, 8, 9, 11, 12 |
| Provide expert image interpretation | CiPs 8, 9, 11 |
| Be able accurately to report most cases | CiPs 8, 9, 11 |
| Write clear succinct reports which emphasise the key findings and diagnoses | CiPs 8, 9, 11 |
| Intervention – see General and non-vascular intervention | CiPs 9, 11 |
| Automatically prioritise cases according to clinical need | CiPs 1, 7 |
| Be able to discuss complex cases with referring clinicians and colleagues | CiPs 6, 12 |
| Be able to relate clinical and imaging findings succinctly | CiPs 6, 8, 9, 11, 12 |
| Undertake an active role in service delivery | CiPs 2, 3, 4 |
| Assume a leadership role in multidisciplinary meetings | CiPs 6, 12 |
| Offer timely specialist opinion | CiPs 8, 9, 11 |
| Discuss with specialist centre appropriately | CiPs 7, 8, 9, 11, 12 |

25. Vascular radiology

25.1 Core vascular radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To acquire basic clinical, pathological and radiological understanding of vascular disease with reference to common presentations | |
| Understand clinical significance of pathology associated with presentation and link with likely diagnoses | CiPs 7, 13 |
| Identify the role of vascular radiology in the specific clinical setting | CiPs 7, 13 |
| Recall basic vascular anatomy in clinical practice relevant to imaging examinations of the: <ul style="list-style-type: none"> • gastrointestinal tract • trauma • peripheral vascular disease • cerebrovascular disease • cancer • aorta • dialysis access • veins | CiP 8 |
| Local/regional guidelines in relation to vascular presentations | CiPs 4, 12, 13 |
| Report plain radiographs relevant to CV disease showing awareness of limitations | CiP 8 |
| Determine optimal imaging examination | CiP 7 |
| Undertake basic assessment of the urgency of clinical situation | CiPs 11, 14 |
| Construct imaging pathway in relation to management options for vascular pathologies | CiP 7 |
| Perform and report basicvascular US, CT, MRI | CiPs 8, 9 |
| Perform and report basic emergency vascular CT | CiP 8 |
| Apply/adhere to local/regional/national guidelines | CiPs 9, 12 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Observe and reflect on MDT working | CiP 12 |
| Communicate sensitively and appropriately with patients | CiPs 1, 13 |
| Involve seniors appropriately | CiPs 6, 8, 9 |
| Tailor examination to clinical indication | CiP 7 |
| Communicate results rapidly | CiP 8 |
| Obtain informed consent where appropriate | CiPs 9, 13 |
| Prioritise workload to respond to the most urgent cases first | CiPs 11, 14 |
| Recognise the need for timely specialist opinion from other clinicians/radiologists | CiPs 8, 13 |

25.2 Level 1 vascular radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To acquire detailed clinical, pathological and radiological understanding of vascular disease with reference to presentations and common diagnoses to a level where a definitive report can be produced for common clinical presentations | |
| Knowledge of vascular anatomy of all organ systems and peripheral circulation | CiP 8 |
| Recognise typical and variant presentations of common conditions | CiPs 8, 13 |
| Familiarity with common acute and elective presentation of vascular pathologies in different organ systems and clinical scenarios | CiPs 8, 13 |
| Recognise the clinical sequelae of the diagnoses of vascular conditions | CiPs 8, 13 |
| Recognise the medical, interventional and surgical management options for vascular conditions | CiPs 8, 13 |
| Understand the principles and practice of safe sedation | CiPs 9, 13 |
| Know how to resuscitate and initially manage an acutely unwell patient in the settings of trauma, haemorrhage or sepsis | CiP 14 |
| Be able to accurately report most cases and emphasise the key findings and diagnoses | CiP 8 |
| Perform acute interventions in the emergency or on call setting | CiP 14 |
| Organise and undertake appropriate imaging pathways in investigating vascular conditions | CiP 7 |
| Recognise/seek clinical and radiological information which advances diagnosis | CiP 7 |
| Appropriately prioritise common and uncommon presentations | CiPs 8, 11, 14 |
| Recognise how diagnosis affects management pathway | CiPs 8, 13, 14 |
| Perform clinical assessment of patients with vascular conditions in ward and out-patient settings | CiPs 13, 14 |
| Develop procedural skills in elective and acute cases: | |
| Ultrasound and fluoroscopy guided insertion of tunnelled and peripheral access lines (PICC, Hickman and dialysis) | CiPs 13, 14 |
| Perform diagnostic angiography | CiPs 13, 14 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Perform angioplasty and stenting in various territories | CiPs 13, 14 |
| Perform inferior Vena Cava Filter Insertion and retrieval | CiPs 13, 14 |
| Perform embolisation for common and some uncommon indications, including to control haemorrhage, for varicocoele and fibroids | CiPs 13, 14 |
| Perform Dialysis fistula interventions including techniques for fistula salvage - Thrombolysis/thrombectomy | CiPs 13, 14 |
| Perform Venous/Arterial thrombolysis in acute arterial/venous occlusion | CiPs 13, 14 |
| Perform thrombin injection of false aneurysm | CiPs 13, 14 |
| Retrieval of Intravascular Foreign Bodies | CiPs 13, 14 |
| Able to deploy closure devices | CiPs 13, 14 |
| Demonstrates proficiency in cross-sectional vascular imaging interpretation | CiP 8 |
| Develop proficiency in vascular ultrasound for: <ul style="list-style-type: none"> • peripheral vascular disease • carotid arteries • venous obstruction/thrombosis • dialysis access | CiP 9 |
| Recognise and manage complications of vascular interventions | CiPs 13, 14 |
| Perform safe sedation, including the assessment and management of complications of sedation | CiPs 9, 13 |
| Clinical assessment of acutely unwell patients in the setting of trauma, haemorrhage or sepsis | CiPs 13, 14 |
| Seek additional clinical information relevant to case | CiP 7 |
| Initiate additional examination/investigation as appropriate | CiP 7 |
| Participate in MDTs | CiP 12 |
| Perform reflective learning from clinical practice, audit and where relevant, registry data | CiP 3 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Take part in teaching and training | CiP 5 |
| Demonstrate a highly organised work pattern | CiP 1 |
| Show openness to critical feedback of reports | CiP 3 |
| Appreciate the importance of keeping up to date with clinical developments and with relevant safety issues | CiPs 1, 3 |
| Be available and able to discuss cases with clinical colleagues | CiP 7 |

26. Academic radiology

26.1 Core academic radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| To acquire basic competences in teaching and research appropriate to a trainee in Academic Radiology | |
| To concurrently pursue core training in radiology specific and generic specific aspects of the Radiology Curriculum | |
| Understand process of grant application | CiP 4 |
| Understand research governance | CiPs 1, 4 |
| Familiarity with research methods appropriate to area of interest. | CiP 4 |
| Familiarity with current literature, especially in areas of own interest | CiP 4 |
| Basic research skills including statistics and GCP training | CiP 4 |
| Contribute to the writing of grant applications | CiP 4 |
| Contribute to completion of applications to Research Ethics Committees (REC), Research and Development Department, MHRA etc.. | CiP 4 |
| Contribute to the formation and execution of audit and research projects | CiPs 1, 2, 3, 4 |
| Developing skills in management and leadership | CiPs 1, 2, 6 |
| Develop presentation and teaching skills | CiP 5 |
| Formally participate in the running of a local teaching programme | CiP 5 |
| Literature search techniques | CiP 4 |
| Participate fully in clinical audit and research | CiPs 3, 4 |
| Attend relevant educational meetings | CiP 5 |
| Interact with relevant research scientists | CiPs 4, 6 |
| Access and develop the learning materials | CiP 5 |

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|---|-----------------------------|
| Contribute to the teaching programme of the training centre | CiP 5 |
| Present research and audit at national and international meetings | CiPs 3, 4 |
| Publish in appropriate journals | CiP 4 |

26.2 Level 1 academic radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Acquire increasing competences in teaching and research appropriate to a trainee in Academic Radiology | |
| Detailed knowledge of undertaking a major research project | CiP 4 |
| Maintain familiarity with the literature and searching techniques | CiP 4 |
| Maintain and develop knowledge of relevant methodology including epidemiology and statistics | CiP 4 |
| Write own grant application | CiP 4 |
| Prepare and present application to REC etc. | CiP 4 |
| Participate in management and leadership of research project | CiPs 1, 2, 3 |
| Help to run local teaching programme | CiP 5 |
| Present regularly at national and international meetings | CiP 4 |
| Active role in audit | CiP 3 |
| Be able to perform a detailed literature search | CiPs 4, 5 |
| Maintain and develop relevant radiology expertise | CiPs 1 - 12 |
| Develop confidence as a research supervisor | CiPs 4, 5 |
| Take part in teaching and training | CiP 5 |

26.3 Level 2 academic radiology

| Knowledge, skills and behaviours from 2016 curriculum | Location in 2021 Curriculum |
|--|-----------------------------|
| Acquire full competences in teaching and research | |
| Know how to plan and execute research projects independently | CiPs 1, 2, 4 |
| Know how to organise and manage a teaching programme | CiPs 2, 5 |
| Be able to perform complex literature searches | CiPs 4, 5 |
| Maintain and develop relevant radiology expertise | CiPs 1 - 12 |
| Help to organise and manage a teaching programme | CiPs 2, 5 |
| Plan and execute research projects independently | CiPs 1, 2, 4 |
| Assume a lead role in audit | CiPs 2, 3 |
| Provide appropriate research supervision of other healthcare professionals | CiPs 1, 4, 5 |
| Full competence as a research supervisor | CiPs 1, 2, 4, 5 |



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The Royal College of Radiologists. *Interventional Radiology Curriculum Mapping Document* London: The Royal College of Radiologists, 2019.

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