

# **Interventional Radiology Curriculum** Mapping of the 2021 curriculum outcomes to the 2016 curriculum competences

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### 1. Introduction

The curriculum provides both trainers and trainees with information about he 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 changes 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The separate tables of presentations and conditions for each special interest area in the 2016 curriculum have been replaced by a single combined table of presentations and condition in the 2021 curriculum.

## 2. General and Non-Vascular Intervention

#### 2.1 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 referent to presentations and common diagnoses to a level where a definitive report can be produced for common clini 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
<ul> <li>Perform advanced nutritional procedures :</li> <li>radiological insertion of gastrostomies/jejunostomies</li> <li>adjustment of gastric bands</li> </ul>	CiPs 13, 14
Increase skills in imaging guided intervention using ultrasound and CT Perform:	CiPs 13, 14
Convert: • 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

#### 2.2 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 to presentations and uncommon diagnoses to a level where a definitive report can be 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
Perform tumour ablation	CiP 13

Knowledge, skills and behaviours from 2016 curriculum	Location in 2021 Curriculum
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: chemoembolization, 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

## **3. Vascular Intervention**

#### 3.1 Level 1 Vascular Training

Knowledge, skills and behaviours from 2016 curriculum	Location in 2021 Curriculum
To acquire detailed clinical, pathological and radiological understanding of vascular disea and common diagnoses to a level where a definitive report can be produced for commo	
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 accurately to 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 outpatient 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

Knowledge, skills and behaviours from 2016 curriculum	Location in 2021 Curriculum
Perform diagnostic angiography	CiPs 13, 14
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
<ul> <li>Develop proficiency in Vascular Ultrasound for:</li> <li>Peripheral vascular disease</li> <li>Carotid arteries</li> <li>Venous obstruction/thrombosis</li> <li>Dialysis access</li> </ul>	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

## 3.2 Level 2 Vascular Training

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 uncomm presentations and diagnoses to a level where a definitive report can be produced for the great majority of clinic presentations	
Detailed understanding of clinical presentations and diagnoses	CiPs 8, 13
Detailed knowledge of normal and variant vascular anatomy relevant to above	CIP 8
Detailed knowledge of chemotherapeutic/radioembolisation agents and their side effect profiles, relevant to above	CiPs 13, 14
Recognition of uncommon conditions	CiPs 13, 14
Understands and is able to advise on risk factor modification including diabetes	CiPs 13, 14
Become competent in the clinical examination of the vascular patient	CiPs 13, 14
Provide expert advice on vascular foot care including the diabetic foot	CiPs 13, 14
Interpret laboratory data and non-invasive investigations e.g. APBI and exercise testing	CiPs 13, 14
Appropriately prioritise all presentations	CiPs 13, 14
Provide expert opinion on appropriate patient imaging	CiP 8
Provide expert image interpretation	CiP 8
Perform acute interventions in the emergency or on call setting	CiPs 13, 14
Organise and undertake appropriate imaging pathways in investigating vascular conditions	CiP 7
Independently run one stop clinics	CiPs 13, 14
Perform all complex angioplasty and stenting e.g. renal,carotid ,visceral and below knee	CiPs 13, 14
Perform surgical exposure of arteries and veins	CiPs 13, 14
Perform super-selective embolisation and chemo-embolisation for all indications	CiPs 13, 14

Knowledge, skills and behaviours from 2016 curriculum	Location in 2021 Curriculum
Perform complex procedures for central vascular access	CiPs 13, 14
Perform TIPSS	CiPs 13, 14
Perform endovascular stent grafting e.g. EVAR, TEVAR	CiPs 13, 14
Perform venous ablation and sclerotherapy	CiPs 13, 14
Recognise and manage unusual complications of vascular interventions	CiPs 13, 14
Automatically prioritises cases according to clinical need	CiPs 13, 14
Be able to discuss complex cases with referring clinicians and colleagues	CiPs 13, 14
Be able to relate clinical and imaging findings succinctly	CiP 8
Undertake an active role in service delivery	CiPs 2, 6
Assume a leadership role in multidisciplinary meetings	CiP 12
Offer timely specialist opinion	CiP 8
Discuss with specialist centre appropriately	CiP 8
Enter performance data into local and national registries	CiP 13

## 4. Interventional Neuroradiology

#### 4.1 Level 1 Diagnostic Neuroradiology Training

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 referent to presentations and common diagnoses to a level where a definitive report can be produced for common clinit presentations	
Detailed applied anatomy relevant to cranial and spinal imaging examinations	CiP 8
Know a wide range of intracranial pathologies, their imaging and clinical management	CiPs 7, 8
Know a wide range of spinal pathologies, their imaging and clinical management	CiPs 7, 8
Interpret MRI examination	CiP 8
Recognise/seek clinical and radiological information which advances diagnosis	CiPs 7, 8
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)	CiPs 7, 8, 9
Perform biopsy of straightforward spinal lesions	CiPs 9, 11
Formulate a Management Plan	CiP 7
Seek additional clinical information relevant to case	CiP 7
Initiate additional examination/investigation as appropriate	CiPs 7, 9, 11
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	CiPs 1, 2
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, 2, 3, 4
Be available and able to discuss cases with clinical colleagues	CiP 7

## 4.2 Level 2 Diagnostic Neuroradiology Training

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 to a level where a definitive report can be produced for the great majority o 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 7, 8, 9, 11, 12
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, 11
Report and undertake more complex examinations	CiPs 8, 9, 11
Provide expert opinion on appropriate patient imaging	CiPs 7, 8, 9
Provide expert image interpretation	CiPs 8
Take part in teaching and training of junior trainees and associated specialities	CiPs 5
Automatically prioritises cases according to clinical need	CiPs 9
Be able to discuss complex cases with referring clinicians and colleagues	CiPs 7
Be able to relate clinical and imaging findings succinctly	CiPs 8, 12
Undertake an active role in service delivery	CiPs 2
Assume a leadership role in multidisciplinary meetings	CiPs 6, 12
Offer timely specialist opinion	CiPs 7, 8, 11
Discuss with specialist centre appropriately	CiPs 7, 8, 9

## 4.3 Basic Clinical and Interventional Skills relevant to Interventional Neuroradiology

Knowledge, skills and behaviours from 2016 curriculum	Location in 2021 Curriculum
To acquire basic clinical, pathological and radiological understanding of neurological disease with reference to commo presentations	
Understand clinical significance of pathology associated with presentation and link with likely diagnoses	CiP 13
Identify the role of interventional neuroradiology in specific clinical settings	CiPs 7, 11, 13
Recall basic anatomy in clinical practice relevant to imaging examinations of the brain and spine.	CiP 8
Recall the basic vascular anatomy in clinical practice relevant to imaging examinations of the head & spine.	CiP 8
Local/regional guidelines in relation to neuroradiological presentations	CiPs 2, 4, 13
Report radiographs relevant to neurological disease showing awareness of limitations	CIP 8
Determine optimal imaging examination	CiP 7
Undertake basic assessment of the urgency of clinical situation	CiPs 7, 11
Construct imaging pathway in relation to management options for neurological pathologies	CiP 7
Performance/protocol of basic non invasive imaging; US, CT, MRI	CiPs 7, 8, 9
Recognise/seek clinical and radiological information which advances diagnosis	CIP 7
Recognise clinical priority of certain presentations	CiPs 7, 11, 13
Recognise how diagnosis affects management pathway	CiPs 7, 13
Obtain patient consent and adhere to relevant guidelines	CiPs 2, 4, 9
Develop skills preparing for and assisting with INR procedures	CiPs 4, 9, 13
Perform diagnostic catheter angiography and vascular / non vascular interventional procedures	CiPs 9, 14
Recognise complications of interventional procedures	CiPs 13, 14

Knowledge, skills and behaviours from 2016 curriculum	Location in 2021 Curriculum
Apply/adhere to local/regional/national guidelines	CiPs 1, 2, 3, 4
Observe and reflect on MDT working	CiPs 6, 12
Communicate sensitively and appropriately with patients	CiPs 1, 4
Involve seniors appropriately	CiPs 1, 6, 8, 9
Tailor examination to clinical indication	CiPs 7
Communicate results rapidly	CiPs 8
Obtain informed consent where appropriate	CiPs 9
Prioritise workload to respond to the most urgent cases first	CiPs 7, 8, 9
Recognise the need for timely specialist opinion from other clinicians/radiologists	CiPs 8, 9

# 4.4 Level 1 Interventional Neuroradiology Training

Knowledge, skills and behaviours from 2016 curriculum	Location in 2021 Curriculum
o acquire detailed clinical, pathological and radiological understanding of neurological disease with reference o presentations and common diagnoses to a level where a definitive report can be produced for common clinic presentations	
Recall the anatomy of the CNS & related vasculature including anatomical variants	CiPs 8
Recognise typical and variant presentations of common conditions	CiPs 8
Familiarity with common acute and elective presentation of neurological pathologies amenable to intervention in clinical scenarios	CiPs 8, 13
Recognise the clinical sequelae of the diagnoses of neurological conditions	CiPs 8, 13
Recognise the medical, interventional and surgical management options for neurological conditions	CiPs 8, 9
Be able accurately to report most cases and emphasise the key findings and diagnoses	CiPs 7, 8
Participate in diagnostic and interventional neuroradiology rota (where appropriate)	CiPs 8, 11, 13, 14
Organise and undertake appropriate imaging pathways in investigating neurological conditions	CiPs 7, 8, 13
Perform clinical assessment of patients with neurological conditions in ward and outpatient settings	CiPs 13, 14
Take part in outpatient clinics	CiPs 13
Increase procedural skills in elective and acute cases:	
Increase skills in Vascular Ultrasound examination in Carotid arteries and vertebral (optional)	CiPs 9, 14, Tables 4-6,
Perform complex cerebral angiography	CiP 14, Tables 4-6
Perform balloon test occlusion	CiP 14, Tables 4-6
Coil a cerebral aneurysm (non-complex)	CiP 14, Tables 4-6
Perform appropriate embolisation techniques	CiPs 13, 14, Tables 4-6
Appropriate management of cerebral venous thrombosis	CiPs 13, 14, Tables 4-6

Knowledge, skills and behaviours from 2016 curriculum	Location in 2021 Curriculum
Recognise complications of vascular interventions	CiPs 13, 14
Seek additional clinical information relevant to case	CiPs 7
Initiate additional examination/investigation as appropriate	CiPs 7, 8, 9, 11
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 5
Demonstrate a highly organised work pattern	CiPs 1, 2
Show openness to critical feedback of reports	CiPs 1, 3, 6, 8, 9
Appreciate the importance of keeping up to date with clinical developments and with relevant safety issues	CiPs 1, 2, 4
Be available and able to discuss cases with clinical colleagues	CiPs 7, 8
Enter performance data into local and national registries	CiPs 3, 4

# 4.5 Level 2 Interventional Neuroradiology Training

Knowledge, skills and behaviours from 2016 curriculum	Location in 2021 Curriculum
To acquire detailed clinical, pathological and radiological understanding of neurova uncommon presentations and diagnoses to a level where a definitive report can be p clinical presentations	
Detailed understanding of clinical presentations and diagnoses	CiP 13
Knowledge of clinical neuroscience topics relevant to the care of patients with neurovascular diseases	CiP 13
Detailed knowledge of the anatomy of the central nervous system and related vasculature, including anatomical variations	CiPs 8, 13
Detailed understanding of diagnostic and interventional imaging equipment and techniques	CiPs 10, 13, 14
Recognition of uncommon conditions	CiPs 8, 13
Provide expert opinion on appropriate patient imaging	CiPs 7, 8, 13
Provide expert image interpretation	CiPs 8, 13
Perform acute neuroradiology interventions in the emergency or on call setting	CiP 14
Organise and undertake appropriate imaging pathways in investigating neurovascular conditions	CiPs 7, 8, 13, 14
Independently runs outpatient clinics	CiP 13
Increase procedural skills in elective and acute cases:	
Perform complex angioplasty and stenting	CiP 14, Tables 4-6
Perform appropriate embolisation of cerebral AVMs, dural AV fistula and craniofacial & spinal tumours	CiP 14, Tables 4-6
Coil cerebral aneurysms	CiP 14, Tables 4-6
Use of rescue procedures, thrombolytics, antiplatelet agents, balloon, stent, snare or other retrieval devices	CiP 14, Tables 4-6
Use of complex assist techniques, balloon, stent or multiple catheters	CiP 14, Tables 4-6,
Perform mechanical thrombectomy for hyperacute ischaemic stroke	CiP 14, Tables 4-6

Knowledge, skills and behaviours from 2016 curriculum	Location in 2021 Curriculum
Appropriate management of cerebral venous thrombosis	CiP 14, Tables 4-6
Recognise and manage complications of neurovascular interventions	CiP 13,14
Perform spinal interventional procedures for biopsy, pain control or spinal stabilisation	CiP 14, Tables 4-6
Automatically prioritises cases according to clinical need	CiP 9
Be able to discuss complex cases with referring clinicians and colleagues	CiP 7
Be able to relate clinical and imaging findings succinctly	CiPs 8,12
Undertake an active role in service delivery	CiP 2
Assume a leadership role in multidisciplinary meetings	CiPs 6,12
Offer timely specialist opinion	CiPs 7, 8, 11
Discuss with specialist centre appropriately	CiPs 7, 8, 9
Aware of requirement to register new interventional procedures and of processes to introduce new equipment	CiPs 2, 3, 4, 13

#### Interventional Radiology Curriculum

Mapping of the 2021 curriculum outcomes to the 2016 curriculum competences



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