



Jordanian Royal  
Medical Services  
الخدمات الطبية الملكية   
@royalmedicalJO

# **Interventional Radiology Specialty Training Curriculum In King Hussein Medical Center Amman – Jordan**

## ➤ The purpose of the curriculum:

- Interventional radiology is the sub-specialty encompassing the diagnosis, investigation and image guided therapeutic management of a wide range of conditions. Patients are referred to interventional radiologists for assistance in diagnosis, deciding on the best management of a patient's condition and for image guided, minimally invasive, procedures where this is judged the best treatment option. Interventional radiology and interventional neuroradiology services are provided 24 hours a day. Interventional radiologists provide support for major trauma, gastrointestinal and obstetric hemorrhage in addition to management of hemorrhage in other territories, control of sepsis and relief of life or limb threatening vascular occlusion and other luminal obstruction. Interventional neuroradiologists provide support for neuro-vascular emergencies including stroke.

- Interventional radiology plays a pivotal role in diagnosis and treatment of emergency conditions, with the reduced risks of minimally invasive techniques improving patient outcomes and reducing length of stay. The use of minimally invasive techniques serves patient need by providing less pain, less recovery time and often lower risk in comparison to open surgery.
- Patients also require access to non-acute services, such as angioplasty, stenting and treatment of vascular malformations.
- Interventional radiology also supports cancer services, for example by performing lung, liver and kidney tumour ablation and providing central venous access for the delivery of chemotherapy.
- In the field of neuroradiology, interventional neuroradiologists are essential for the provision of life saving treatments such as cerebral aneurysm coiling for sub-arachnoid haemorrhage and mechanical thrombectomy for large vessel occlusion, which have largely replaced much more invasive neurosurgical operations.

## Core Syllabus:

For those radiologists who do not intend to specialise in IR but practice diagnostic radiology with an interest in basic IR skills, it is expected that access to parts of the modular training programmes will be available. Such trainees should have a thorough knowledge of the performance and interpretation of diagnostic vascular techniques and a basic understanding of common IR procedures. All trainees should have this core set of skills before embarking on specialist IR training and will have obtained diagnostic skills during their initial diagnostic radiology training. This core syllabus also forms part of the specialises IR curriculum for practitioners who wish IR to be the major aspect of their professional practice. At the conclusion of training, the trainee will be familiar with the following aspects:

- Outpatient clinic for interventional radiology .
- Relevant anatomy for all the various organ systems in the body relevant to IR practice including embryology and normal variants – Understand the complementary roles of the various imaging modalities in the assessment planning, treatment and overall management of the system.
- Epidemiology including expected outcomes.
- Pathophysiology including: – Aetiology – Risk factors
- Clinical presentation – Be able to elicit appropriate clinical

history, perform physical examination and assess and classify patients.

- Investigation – Select appropriate laboratory and imaging investigations pertinent to treatment for all the relevant organ systems.
- Informed consent copy form interventional radiology procedures.
- Therapeutic options:
  - Know the indications, contraindications and understand the range of treatment strategies including medical, endovascular/interventional and surgical alternatives to a level sufficient to be able to discuss management with patients and formulate appropriate treatment plans within an MDT
  - Know the outcomes of interventional procedures including complications, how to avoid them and their management
  - Understand pre-, peri- and post-procedural drug requirements including the use of chemotherapeutic drugs used in oncology and embolisation.
  - Patient selection and appropriate use of local sedo-analgesia and general anaesthetics.
  - Ongoing care of in-patient and daily progress notes.
- Post procedural progress notes.

## Trainee's Duties:

The trainee must ensure that the following information exists in each patient's file:

1. Complete medical history with physical examination
2. Radiological and laboratory tests results
3. Treatment plan pre and post procedure
4. Post procedure progress notes
5. Other consultations
6. informed consent copy
8. Anesthesia report
9. Daily progress notes

The trainee must work at the outpatient clinic to examine and participate in the treatment planning.

Maintain good relations with the patient and his family and the medical, nursing and administrative staff.

Confidentiality.

Trainee must record his scientific activities in logbook:

- 1- procedures (types, number and medical records)
- 2- Meetings and conferences
- 3- Logbook must be recognized and signed by trainer

## Fundamental Topics in Interventional Radiology

At the conclusion of training, the trainee will be familiar with the following topics :

- **Vascular Diagnosis and Intervention**

- Arterial Disease
- Peripheral Arterial Disease (acute and chronic limb ischaemia)
- Aortic and Upper Extremity Arterial Disease
- Aortic Dissection and Aneurysmal Disease (Endovascular aneurysm repair including thoracic and abdominal endovascular aortic repair and management of endoleaks)
- Visceral aneurysms and pseudo aneurysms

- Supra-aortic Arterial Disease
- Hemorrhage control (embolization, stent grafting) .
- Visceral Artery Aneurysms
- Visceral Artery Ischemia
- Gastrointestinal Hemorrhage
- Bronchial and pulmonary arterial embolization for patients with recurrent haemoptysis .
- Recognise the artery of Adamkiewicz and its clinical significance



- Stroke
- Vascular Malformations
- Vascular Trauma
- Visceral Arterial Disease
- Arterial Problems in Obstetrics and Gynaecology
- Prostate Artery Embolization (PAE)
- Priapism
- Venous Disorders
- Venous Thrombosis and Insufficiency (Management of acute and chronic thromboembolic disease including thrombolysis, mechanical and pharmacological)
- Pulmonary Thromboembolic Disease
- Disease of the Superior and Inferior Vena Cava
- Portal and Hepatic Venous Interventions
- Portal Venous Disease and Transjugular Intrahepatic Portosystemic Shunt (TIPS) and Balloon-Occluded Retrograde Transvenous Obliteration (BRTO)
- Hepatic Venous Disease and Budd-Chiari syndrome
- Gonadal Venous Interventions
- Haemodialysis Access
- Central Venous Access (tunnelled line and port insertion)
- Venous Sampling (Adrenal sampling, Inferior Petrosal Sinus Sampling IPSS)
- IVC filter placement
- Retrieval of intravascular foreign bodies

- **Interventional Neuroradiological Procedures**

- US guided arterial puncture (including direct carotid artery puncture) .
- Cerebral and spinal angiography including use of microcatheters, tri-axial systems and occlusion testing .
- All endovascular forms of treatment of intra / extra cranial aneurysm and treatment of cerebral vasospasm.
- Embolisation for hemorrhage e.g. epistaxis or vessel trauma
- Endovascular procedures for device migration, malfunction or vessel perforation .
- Cervical vessel angioplasty and stenting including carotid blow out.
- Endovascular treatment of stroke due to large vessel occlusion (mechanical thrombectomy) .
- Thrombolysis (arterial and dural venous sinus)
- Embolisation of dural, brain, craniofacial or spinal tumour
- Embolisation of cerebral, dural and spinal AVM or AVF
- Specific endovascular techniques for infants and neonates e.g. embolisation of Vein of Galen malformation or high flow pial AVF, childhood capillary, venous and lymphatic malformations

## - Interventional Oncology (IO)

### Intra-arterial Procedures

- Chemoembolization (TACE)
- Chemoembolization (DEB)
- Radioembolization

### Tumor ablation

- Cryoablation
- Radiofrequency ablation (RFA)
- Microwave ablation

### Supportive Procedures

- Paracentesis or Thoracentesis
- PICC line placement
- Tunneled catheter placement
- Port catheter placement
- Percutaneous biliary drainage
- Percutaneous nephrostomy.
- Pleurx catheter placement
- Stenting of malignant strictures: bile duct, esophageal, tracheobronchial and intestinal
- Portal vein embolization

## Non-Vascular Interventions in the Chest, Gastrointestinal Tract and Hepatobiliary Systems

- Image-Guided Biopsy
- Image-Guided Aspiration and Drainage of Collections and Abscesses
- Gastrointestinal Interventions
- Enteral Tube Placement (Gastrostomy, Gastrojejunostomy, Jejunostomy, Caecostomy).
- Gastrointestinal Stenting
- Hepato-Pancreatico-Biliary (HPB) Intervention (percutaneous, plugged and trans-jugular Biliary obstruction – dilatations, biopsy, drainage and stents)
- Dilatation of benign strictures, achalasia
- Embolization for GI tract bleeding
- Tumour ablation techniques and embolization procedures (Transcatheter Arterial Chemoembolization, TACE) .

- **Intervention of the Genito-Urinary Tract and Renal Transplants**

- Pelvicalyceal and Ureteric Obstruction (Management of stonedisease

Management of urinary tract obstruction – nephrostomy and ureteric stents) .

- Renal Masses and Perirenal Collections

- Genito-Urinary Interventions

- Embolization for urinary tract bleeding and for benign disease e.g. Angiomyolipoma/ Benign Prostate Hyperplasia

- Treatments for testicular pain and infertility (Varicocele Embolization) .

- Diagnosing and management of

Erectile dysfunction

(Cavernogram)

- **Interventional Radiology of Gynecological Conditions**

- Post- partum haemorrhage

- management of menorrhagia

- Treatments for pelvic pain including embolization for fibroids, adenomyosis, endometriosis, pelvic venous congestion

- Infertility treatments

- **Interventional Radiology of the Musculoskeletal System**

- Image-Guided Biopsy
- Percutaneous Ablation of Bone and Soft Tissue Lesions