

# **Interventional Radiology Curriculum for Medical Students**

## **Introduction**

**It has been recognized that the teaching of radiology in medical schools is vital both for the education of medical students as well as for the future practice of medicine irrespective of their specialty.**

**In addition, it is important that medical students comprehend the increasing role of interventional radiology in hospital medicine.**

**CIRSE has published a curriculum of interventional radiology for medical students, to provide guidance on the learning outcomes required to prepare medical students for their role during Residency Years and subsequent life-long learning.**

**This curriculum presupposes that clinical radiology will be taught as a continuous strand throughout the undergraduate medical years. Ideally, interventional radiology teaching should be delivered as part of the clinical radiology teaching programme.**

**The curriculum does not specify forms of delivery. It is felt that this should be left to schools to determine, depending on local circumstances.**

**This curriculum is limited to material that is essential and justifiable. It focuses on common acute clinical problems. Rare clinical conditions are included where their identification can help avoid a potentially serious outcome.**

**It is recommended that the students' interventional radiology curriculum should impart knowledge of:**

- **The basis of interventional radiology and its historical context**
- **Image guidance for interventional procedures**
- **Knowledge of radiation protection guidelines for interventional procedures**
- **Knowledge of the legislation relating to the use of interventional radiology in clinical practice**

## Suggested Core Syllabus

On completion of the program the student should demonstrate knowledge and recognition of the subjects listed below.

### VASCULAR INTERVENTIONAL RADIOLOGY

#### Peripheral Arterial Disease

- Atherosclerosis (pathology, risk factors, genetics, drug management)
- How to diagnose (non-invasive imaging, duplex US, CTA, MRA)
- Angioplasty - how it works and where it is applied

#### Claudication and critical limb ischemia

- Clinical presentation of each condition and significance
- When and how to image
- The role of IR in treatment

#### Aneurysmal disease – thoracic aorta

- Clinical presentation – rupture risk
- Surgical vs. TEVAR

#### Acute limb ischemia

- Clinical presentation
- Classification of ischemia
- Treatment strategies: thrombectomy / thrombolysis / mechanical / pharmacomechanical

#### Aneurysmal disease – abdominal aorta

- Clinical presentation – rupture risk
- EVAR (indications – tools – success rates, complications)
- EVAR in ruptured AAAs
- Longterm EVAR surveillance – how to treat endoleaks and other complications

### SPECIFIC CASE SCENARIOS

#### A patient with a carotid stenosis

- Cerebrovascular risk associated with carotid bifurcation disease (how to select a patient for treatment? When to treat? What is CEA? What is CAS?)
- Carotid stenting: stent, cerebral protection devices

#### A young patient with sudden onset of hypertension

- The pathophysiology of renovascular hypertension, fibromuscular dysplasia.
- How to image the renal arteries; US vs. MR vs. CTA vs. DSA
- PTA for FMD?

#### A patient with pulmonary embolism

- How to image the pulmonary arteries?
- How to prevent PE; prophylaxis with medications
- Indications for IVC filters?

#### A patient with acute limb swelling and pain

- What is DVT?
- Imaging with US, CT venography and contrast venography
- Common treatment
- When are thrombolysis and adjunctive treatments indicated?

#### A patient with GI Bleeding

- What are the etiologies?
- Modalities of treatment: endoscopy first
- How to image if the first option fails: nuclear medicine vs. MDCT
- When to embolize and how?

#### A patient with hemoptysis

- When to call the Interventional Radiologist?
- What imaging modality will help identify the bleeding site and cause?
- What is bronchial artery embolization?

#### A cirrhotic patient with variceal bleeding or intractable ascites

- How is the diagnosis of portal HTN established
- When is TIPS indicated?
- How is the TIPS performed?
- What are the results and complications?

#### A young man with varicocele

- How to image the scrotum
- What is the significance of varicocele?
- How and when to embolize?

#### A woman with uterine fibroids

- Clinical presentation of fibroids
- Why is Uterine Artery Embolization (UAE) a very good treatment option?
- How is UAE performed?

#### A catastrophic event at childbirth

- What is Post Partum Hemorrhage (PPH)?
- When is the risk for PPH high?
- What is the IR's role in PPH?

#### Trauma

- How to image the severely injured patient
- Embolization of solid organs
- Embolization for pelvic arterial bleeding

## NON-VASCULAR INTERVENTIONAL RADIOLOGY

### Image-guided percutaneous biopsies

- Biopsies of thyroid, breast, and other superficial organs
- Lung and mediastinum
- Liver and pelvis

### SPECIFIC CASE SCENARIOS

#### How to manage the patient with obstructive uropathy

- Percutaneous nephrostomy and ureteric stenting

#### A patient with post-operative fluid collection and sepsis

- How to image abdominal collections
- When and how to drain abdominal and pelvic abscesses

### Interventional Radiology for the GI tract

- Percutaneous gastrostomy
- Esophageal and colonic stents

#### How to manage the jaundiced patient

- List the more common causes of obstructive jaundice
- How to define the level and etiology of obstruction
- When is percutaneous intervention indicated?

## INTERVENTIONAL RADIOLOGICAL ONCOLOGY

### How to ensure venous access for chemotherapy

- What is a PICC line?
- What is a venous port and why should this be performed by an IR?
- What is a Hickman catheter?

### Hepatocellular carcinoma

- Imaging diagnosis
- Patient selection for surgery, ablation, chemoembolization / radioembolization

### Liver metastases

- How to select patients for ablation / or transcatheter treatment

### How to treat renal carcinoma

- When is ablation indicated?
- What is the role of embolization for RCC?

### When and how to treat lung masses

- RFA and other ablative techniques

## MUSCULOSKELETAL INTERVENTIONAL RADIOLOGY

- When and how to perform an image guided biopsy of muscles and bones
- When and how to image a patient with back pain and neuralgias
- When and how to perform percutaneous image guided decompression of intervertebral discs

- When and how to perform percutaneous image guided vertebral augmentation techniques (vertebroplasty, kyphoplasty)
- When and how to perform percutaneous image-guided ablation of bone or soft tissue lesions (benign and malignant)

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