

**POST DOCTORAL FELLOWSHIP IN VASCULAR AND
INTERVENTIONAL RADIOLOGY**

Duration of the course : 2 Years

Syllabus:

Introduction:

Significant technological advances in Radiological Interventions and Vascular Imaging have taken place during the last decade, making it difficult to have thorough training in all modalities, as well as covering different subspecialties during the PostGraduate Radiology course. All round training in Interventional and Vascular Imaging requires facilities that can be provided only in a tertiary care hospital. The Department of Radiology is well placed with state of art equipment and experienced staff covering all modalities and specialties.

Definition:

Fellows in Intervention radiology will be fully qualified radiologist (MD/DNB Radiodiagnosis) who have had a further period of training in intervention radiology programs which are practical and evidence based. The development of such educational programs will adequately prepare radiology residents for intervention radiology in their practice.

Aim of the training:

The aim of the fellowship is to enable the candidate to become clinically competent and to consistently interpret the results of invasive investigations accurately and reliably. The candidate should also be capable of providing a comprehensive and safe interventional diagnostic and therapeutic service.

Objectives of the training:

The trainee requires a sound understanding of the basis of interventional radiology including:

- the embryology, anatomy, normal variants and physiology of the appropriate body system(s)
- the current interventional equipment used including:
 - percutaneous access needles and kits
 - catheters and guidewires
 - dilating devices
 - stents
 - embolisation materials
- specific techniques of access to and therapeutic intervention within various organs & structures
- local, national and where appropriate, international imaging and interventional guidelines

Knowledge of the full range of radiological diagnostic & therapeutic techniques available, in particular:

- the indications, contraindications and complications of each method
- the factors affecting the choice of equipment, contrast media and route of approach
- the effects and sideeffects of these method

Particular emphasis should be placed on the strengths and weaknesses of the different methods in various pathological conditions. The appropriate choice of imaging and interventional techniques in the investigation and treatment of specific clinical problems should be emphasised.

The trainee is expected to keep abreast of other imaging techniques relevant to their practice.

The expected outcome at the end of this subspecialty training will be that the candidate can select the appropriate imaging strategy to demonstrate the relevant abnormalities, supervise (and perform where appropriate) the examination(s) and accurately report on the findings. The trainee should also be able to select the appropriate intervention and where

required, be capable of carrying out that intervention safely to a successful conclusion.

ORGANIZATION OF TRAINING:

A. Training programs should be in a multidisciplinary centre and should be organized by a qualified, accredited specialist in Intervention Radiology.

B. The Centre should use the guidelines and protocols of national and international professional bodies which are reviewed at regular intervals.

THE MEANS OF TRAINING:

1. The trainees should participate in all relevant activities of the training unit such as the care of Out Patients and In Patients, on call duties during both day and night, also participating in educational activities, including the teaching of other health professionals. Participation in audit and clinical or basic research is essential.

2. The training should be structured throughout with clearly defined targets to be met after specified intervals. An education plan should be drawn up in consultation with the trainees at the beginning of each attachment and progress should be monitored regularly, by means of log book.

A: General Principles:

Each Fellowship student is required to possess a comprehensive knowledge of the imaging modalities used in interventional radiology and develop the skills to do both diagnostic and therapeutic interventional procedures. He/she should have personally performed a sufficient number of interventional procedures and be able to diagnose and treat common adult and paediatric pathologies that are amenable to intervention. He/she should also possess sufficient knowledge and experience in research methodology and development and is expected to complete a research project during the tenure of his fellowship.

CLINICAL SKILLS :

Good familiarity and adequate skills in performing / interpreting vascular imaging modalities (Doppler, CT angiograms, MR angiograms,

MRI)

1. Work up of cases and decide on feasibility for intervention
2. Active involvement in the interdepartmental discussions
3. On call interventional duty
4. Independent skills in diagnostic interventional procedures
5. Partial independent skills in therapeutic interventional procedures

Duration and Rotation of Postings:

Cathlab procedures	18 months (6 months x3)
CT guided procedures	2 months
MRI , MRA	2 months
Ultrasound guided procedures	2 months

1. The trainee should be encouraged and given the opportunity to attend and lead appropriate clinicoradiological and multidisciplinary meetings.
2. The trainee should be encouraged to attend appropriate educational meetings and courses.
3. The trainee should participate in and initiate relevant clinical audit.
4. Trainees will be expected to be familiar with current interventional radiology literature.
5. The trainee should be encouraged to participate in research, and to pursue one or more projects up to and including publication. An understanding of the principles and techniques used in research, including the value of clinical trials and basic biostatistics, should be acquired. Presentation of research and audit results at state and national meetings would be encouraged.
6. The trainee should continue to participate in the oncall rotation, with appropriate consultant back up.
7. Acquisition of specific skills to enable:
 - the conduct, supervision and accurate interpretation of all imaging techniques used to a high professional standard
 - the safe and effective practice of interventional techniques in the appropriate body system(s)
 - good communication with patients and professional colleagues
 - accurate informed consent to be obtained
 - appropriate decisions about terminating the procedure for technical reasons or grounds of safety/ comfort to the patient.

8. A clear understanding of the role of multidisciplinary meetings, including:

- planning of investigations including the selection of appropriate tests and imaging techniques for a clinical problem

Diagnostic arteriography 50

Subspecialty training in vascular and non vascular interventional radiology

Percutaneous angioplasty 10

Percutaneous central venous access 10

Embolisation 10

Vascular stent insertion 5

Foreign body retrieval

Aspiration thrombectomy/ Thrombolysis 10

Peripheral aneurysm exclusion 2

Transjugular intrahepatic portosystemic shunt 5

Chemoembolisation 10

Aortic stent grafting (thoracoabdominal) 4

Uroradiological intervention 10

Drainage of collections 10

Varicocele embolisation

Fallopian tube recanalisation

Transrectal prostate biopsy

GI dilatations and stents

Percutaneous gastrostomy

Transjugular/plugged liver biopsy 5

Radiofrequency ablation 10

Percutaneous biliary drainage procedures
and 10
/or stent insertion

9. Trainees should acquire experience in the practical procedures listed above, and the number of cases undertaken should be recorded in their log book.

10. Regardless of the technique, the consultant trainer must be satisfied that the trainee is clinically competent, as determined by an in training performance assessment, and can consistently interpret the results of investigations accurately and reliably and can safely perform interventional techniques.

The academic activities of the program in the hospital would include:

- Regular academic sessions
- Case discussion and seminars
- Paper presentation
- Audit / Project / Research
- Thesis
- Conferences / CMEs / Live workshops

Research and audit :

- Present at one regional and one national conference.
- Participate in the daily teaching sessions within the department, and make regular presentations.
- Take part in Interdepartmental meetings relevant to the area posted.

To sum up:

The goal of the intervention radiology training is to familiarise the trainee with

A) Performing diagnostic procedures (USG and CT guided)

B) Performing body interventional procedures (Vascular and non-vascular)

C) Interpretation relating studies such as CT Angiography, MR Angiography

D) Performing and interpreting Doppler.

E) The Fellow is expected to complete a project and at least two publications during the course of study.

Recommended reading

Author Name	Name of the Books	Publishing Company
Alrbert L.	Abrams Angiography, Vascular and Interventional Radiology V I ,II and III	Medical Education and Research Inc.
Paul Ross	An Atlas of Normal Vertebral Angiograms.	Butter worth Group
G. Ansel	Complications in Diagnostic Imaging & Radiology	Black well scientific Pub
Joseph K. Lee	Computed Body Tomography. Vol I & II	Raven Press Books Ltd.
Charles F. Lanzleri	Computed Tomography and Magnetic Resonance Imaging of the whole body Vol I & II	Mosby – Year book Inc.
Sandler	Correlative Imaging. Nuclear medicine Magnetic Resonance, Computed Tomography, Ultrasound	Williams & Wilkins
Grainger	Diagnostic Radiology current edition Vol – I , II & III	Churchill Livingstone
M. Pinson	Emergency Interventional Radiology	Little Brown
Albert Mass	Interventional Radiologic Techniques. Computed Tomography and Ultrasonography.	Academic Press Inc.
Joseph I Ferrucci	Interventional Radiology of the Abdomen	Williams & Wilkins
Ernest J. Ring	Interventional radiology principles and Techniques	Little Brown
Wilfrido R Castaneda	Interventional Radiology Vol – I & II	Williams & Wilkins
Wilfrido R Castaneda	Interventional Radiology Vol – II	Williams & Wilkins
Zwiebel	Introduction to Vascular Ultrasonography. 3 rd edition.	