

POST DOCTORAL FELLOWSHIP PROGRAMME IN
VASCULAR AND INTERVENTIONAL RADIOLOGY
SYLLABUS

Course Duration : 2 Years

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 Post-Graduate 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, contra-indications and complications of each method
- the factors affecting the choice of equipment, contrast media and route of approach
- the effects and side-effects of these methods

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:

Entry requirements:-

- MD or DNB in Radiology from an institute or medical college recognized by medical council of India Preference will be given to those who have worked in a teaching institute, tertiary hospital. Selection will be based on a multimodality practical exam and interview.

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 duration of training should be a Minimum of Two Years approved program and should cover the clinical and research aspects.

3. 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.

TRAINING PROGRAMME SYLLABUS:-

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 FOR FELLOWSHIP (Vascular and Interventional Radiology)

1. Good familiarity and adequate skills in performing / interpreting vascular imaging modalities (Doppler, CT angiograms, MR angiograms, MRI)
2. Work up of cases and decide on feasibility for intervention
3. Active involvement in the inter-departmental discussions
4. On call interventional duty
5. Independent skills in diagnostic interventional procedures
6. Partial independent skills in therapeutic interventional procedures

Infrastructure:

Machines:

MR scanners: Floor Mounted DSA
MRI Signa 1.5 T

CT Scanner: 16 Slice and above

USG scanners: C.Doppler System - 2

Duration and Rotation:

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

Total: Two Years

1. The trainee should be encouraged and given the opportunity to attend and lead appropriate clinico-radiological 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 on-call 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

Subspecialty training in vascular and non vascular interventional radiology

Diagnostic arteriography	-	50
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 (thoraco-abdominal)	-	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 /or stent insertion - 10

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
-

ADMINISTRATION :-

Research and audit :-

The fellow will have to:

- • Present at one regional and one national conference.
- Participate in the daily teaching sessions within the department, and make regular presentations.
- Take part in Inter-departmental 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	Abrams Angiography, Vascular and Interventional Radiology V- I	Medical Education and Research Inc.
Alrbert L. Abrams	Abrams Angiography, Vascular and Interventional Radiology V- II	Medical Education and Research Inc.
Alrbert L. Abrams	Abrams Angiography, Vascular and Interventional Radiology V- III	Medical Education and Research Inc.
Paul Ross	An Atlas of Normal Vertebral Angiograms.	Butter worth Group
Paul Ross	An Atlas of Normal Vertebral Angiograms.	Butter worth Group
G. Ansel	Complications in Diagnostic Imaging	Black well scientific Pub
G. Ansell	Complications in diagnostic radiology.	Blackwell scientific
Joseph K. Lee	Computed Body Tomography. Vol - I	Raven Press Books Ltd.
Joseph K. Lee	Computed Body Tomography. Vol – II	Raven Press Books Ltd.
Charles F. Lanzleri	Computed Tomography and Magnetic Resonance Imaging of the whole body Vol - I	Mosby – Year book Inc.
Charles F. Lanzleri	Computed Tomography and Magnetic Resonance Imaging of the whole body Vol – II	Mosby – Year book Inc.
Sandler	Correlative Imaging. Nuclear medicine Magnetic Resonance, Computed Tomography, Ultrasound	Williams & Wilkins
Grainger	Diagnostic Radiology current edition Vol – I	Churchill Livingstone
Grainger	Diagnostic Radiology current edition Vol – II	Churchill Livingstone
Grainger	Diagnostic Radiology current edition Vol – 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	Williams & Wilkins
Wilfrido R Castaneda	Interventional Radiology Vol – II	Williams & Wilkins
Zwiebel	Introduction to Vascular Ultrasonography. 3 rd edition.	