CERTIFIED FELLOWSHIP INTERVENTIONAL RADIOLOGY

[Syllabus Approved by Board of Studies, Medical & Health Sciences]

Programme Code	:	HLTH14A04
Programme Details	:	2-YEARS HBNI CERTIFIED FELLOWWSHIP IN INTERVENTIONAL RADIOLOGY
Programme Learning Outcomes (PLOs / PSOs)	:	MENTIONED [COMMON FOR ALL 2 YRS HBNI CERTIFIED FELLOWSHIPS OFFERED AT TMC]
Eligibility Criteria	:	MD (RADIO-DIAGNOSIS) OR EQUIVALENT PG DEGREE WITH 1-YEAR EXPERIENCE.
Duration of the Course	:	2 YEARS
Programme Structure (Credit-Based)	:	NA
Detailed Course Syllabus	:	ATTACHED
Teaching–Learning Methodologies	:	2 YEARS PROGRAM
Examination & Evaluation System	:	ANNUAL APPRAISAL FOLLOWED BY UNIVERSITY FINAL EXAMINATION
Internship / Project / Dissertation Guidelines	:	NA
Program In Charge	:	PROF. SUYASH KULKARNI (*suyashkulkarnitmh@gmail.com)*

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Programme Outcome:

- The HBNI Fellowship Programmes at Tata Memorial Centre are designed to develop competent, ethical, and academically oriented healthcare professionals with advanced knowledge and skills in their respective specialties and subspecialties.
- At the completion of the fellowship, candidates are expected to demonstrate excellence in clinical practice, patient-centered care, multidisciplinary teamwork, communication, professionalism, and evidence-based decision-making.
- Fellows shall acquire the ability to independently evaluate, diagnose, plan, and manage patients while adhering to institutional protocols, quality standards, patient safety practices, and ethical principles in healthcare delivery.
- The fellowship programmes also aim to foster academic growth, research aptitude, lifelong learning, and leadership qualities among trainees.
- Fellows are expected to actively participate in teaching, seminars, journal clubs, conferences, audits, and research activities, thereby contributing to the advancement of medical science and institutional development.
- Upon successful completion of the programme, the fellow should be capable of functioning independently as a skilled specialist/subspecialist with competence in clinical services, academics, research, and collaborative healthcare practice in tertiary care and oncology-focused settings.

DETAILED SYLLABUS

- **Introduction:**

One of the most significant advances in patient care in this century has been the development of interventional radiology. What started as a tool for pure diagnostic observation has become an indispensable component of therapeutic paradigm for large number of diseases, thanks to the untiring efforts of brilliant innovators in this field. What is more important is the fact that all these procedures are performed through a small percutaneous access and are associated with significantly less morbidity, mortality, hospital stay and thus economic burden. No speciality of medicine is untouched by the magic of interventional radiology. Interventional radiology has also had a significant impact in the management of cancer patients.

The responsibility of passing on this technology to future generations of radiologists is the responsibility of tertiary care institutes like ours. This will result in dissemination of this technology throughout the country and will improve quality of life of thousands of patients.

The training is labor intensive. Large patient load and diversity in the cases are basic requisites for a successful fellowship program. TMH satisfies both these requirements and is ideally posed to become a centre where aspiring fellows can train and gain expertise in basic techniques in general interventional radiology and oncologic interventions in particular.

The entire philosophy of interventional radiology lies in the ability of a radiologist to change his or her mindset from a person who sits at the console and interprets images to a person who assumes clinical responsibility of patient care and participates in overall clinical management of the patient in close concert with the clinical colleagues.

It is a minimally invasive technology with a wide spectrum of applications. There have been significant technological advances in Radiological Interventions and Vascular Imaging during the last decade and especially so in the field of onco-interventions. The applications of onco-intervention require a dedicated training which should include a thorough understanding about the disease process and its adequate management which will subsequently help to improve the longevity & quality of life of patients suffering from malignancies. *An all rounded training in Vascular and Interventional Radiology requires facilities which can be provided only in a tertiary care hospital.* The Department of Radiology at Tata Memorial Hospital is a state-of-the-

art department with a fully operational PACS system and high class equipments covering all modalities.

- **About TMH:**

The Tata Memorial Centre is the National comprehensive cancer centre for the prevention, treatment, education and research in Cancer and is recognised as one of the leading centres for the treatment and research in oncology in India and abroad. TMH is a super speciality hospital with 750 inpatient beds. The hospital is a tertiary care referral centre in India with all modern facilities available in it. Department of Radio diagnosis is equipped with a state of the art equipments including Conventional imaging, Contrast imaging, Digital Mammography including stereotactic biopsies and Mammographic needle localization procedures, Ultrasound with Colour Doppler, Vascular Interventional radiology, Multislice CT scan, MRI, PET-CT etc.

The Intervention Radiology Department of Tata Memorial Centre performs approximately 3000 diagnostics and 2400 therapeutic procedures a year.

- **Following Interventional Radiological procedures are performed:**
  - **Diagnostic Procedures:**
  - **CT Guided Procedures:**
    * CT guided Biopsies
    * CT Guided Drainage Procedures
    * CT Guided Tumor Ablation (RFA)
    * CT Guided Nerve Blocks
    * CT Guided Sclerotherapies
  - MR Angiography
  - Arterial Infusion Catheter Placement
  - Arterial Thrombolysis
  - Arteriograms
  - Biliary Drainage – external
  - Biliary Drainage – internal/external
  - Biliary Drainage – internal metal stent placement
  - ***Biopsy – abdomen/pelvis including Trans-rectal biopsies***
  - ***Biopsy – extremity/bone***
  - ***Biopsy – lung /chest***

- Chemoembolization
- Chest Tube Placement
- Embolization for Bleeding
- Ethanol / Acetic Acid Injection
- Fluid Collection / Abcess & Drainage
- Foreign Body (catheter fragment removal)
- Inferior Vena Cava Filter
- ***Lymphangiograms***
- Nephrostomy Drainage – external
- Nephrostomy Drainage – internal/external
- Nephrostomy Drainage – Internal "double J" stent
- Percutaneous Fluoroscopic Gastrostomy (PFG)
- Pericardiocentesis
- Portal Vein Embolizations
- Pre-operative Embolization
- Pulmonary (lung) Angiogram
- Radiofrequency Ablation (RFA thermal) including intra-operative RFA
- Transarterial Brachytherapy
- Transjugular Liver Biopsy
- Uterine Artery Embolization (UAE)
- Variocele Embolization
- Venograms
- Venous Thrombolysis
- **Interventional Neuroradiological Procedures:**
- Cerebral Angiography
- Skull base Tumor Embolisation
- Intracranial Tumor Embolisation
- Carotid Artery Balloon Test Occlusion
- Planning of Stereotactic Radiosurgery for intracranial AVMs.
- Endovascular Management of Carotid Blow out
- Vertebroplasty / Kyphoplasty

The Interventional Radiology (IR) Unit of the department is a team of health care professionals committed to the cause of enhancing patient care by using advanced technology.

The unit is well equipped with two Digital Subtraction Angiography (DSA) Machines and an Ultrasound Machine. The recently installed DSA machine the 'INNOVA 4100' is state of the art equipment that gives very high resolution angiography Images with the 3D Rotational angiography. With the unique 3D CT acquisition facility on this machine patient need not be shifted to CT scan in emergency as the Angiography and CT like imaging can be done on the same machine.

- **Diagnostic Procedures**
  - Ultrasound Guided Fine Needle Aspiration cytology (FNAC) and Biopsy
  - CT Guided FNAC and Biopsy
  - Diagnostic aspiration of ascitic or pleural fluid for cytology
  - Diagnostic Angiographies
  - Transjugular Liver Biopsy
  - Transjugular Renal Biopsy

- **Therapeutic Procedures**
  - ***Non-Vascular:***
    - Biliary Drainage – external
    - Biliary Drainage – internal/external
    - Biliary Drainage – internal metal stent placement
    - Nephrostomy Drainage – external
    - Nephrostomy Drainage – internal/external
    - Nephrostomy Drainage – Internal "double J" stent
    - Ethanol / Acetic Acid Injection
    - Fluid Collection / Abscess Drainage
    - Foreign Body (catheter fragment) removal
    - Chest Tube Placement

  - ***Vascular:***
    - Angioplasty / Stenting

- ❖ Arterial Infusion Catheter Placement
- ❖ Arterial Thrombolysis
- ❖ Arteriograms
- ❖ Foreign Body (catheter fragment removal)
- ❖ Inferior Vena Cava Filter
- ❖ Uterine Artery Embolization (UAE)
- ❖ Venograms
- ❖ Venous Thrombolysis
- ❖ Transjugular Intrahepatic Portosystemic Shunt (TIPS)
- ❖ Transarterial Brachytherapy
- ❖ Portal Vein Embolizations
- ❖ Pre-operative Embolization
- ❖ Pulmonary Angiogram

- **Interventional Neuroradiological Procedures**
  - Cerebral Angiography
  - Skull base Tumor Embolisation
  - Intracranial Tumor Embolisation
  - Carotid Artery Balloon Test Occlusion
  - Planning of Stereotactic Radiosurgery for intracranial AVMs.
  - Endovascular Management of Carotid Blow out
  - Vertebroplasty / Kyphoplasty

- **Pain Management in Oncology**

  To improve the quality of life of the cancer patients, various image guided procedures are carried out
  - Image Guided nerve Blocks like Celiac Plexus Block,
  - Stellate Ganglion Block
  - Vertebroplasty, Kyphoplasty
  - Transarterial Embolisation
  - Radiofrequency Ablation

- **Tumor Ablation Therapy**

- The tumors which are not suitable for surgery can now be treated by ablation (practically burning them out) using very fine needles,
- Chemical (Ethanol/ Acetic Acid) Ablation
- Radiofrequency Ablation of Liver, Lung, Soft Tissue & Bone and Spine Tumors

- **Thrombosis Management in Oncology**

  Thrombosis of various veins and arteries is a big problem for oncology patients .

  IR unit plays an active role in management of these conditions with procedures like;

  - Deep Vein Thrombolysis / Embolectomy
  - Pulmonary Thrombolysis / Embolectomy
  - Intracranial Venous Sinus Thrombolysis
  - SVC / IVC Filter Placement and Retrieval

- **Emergency Services**

  The IR unit is committed to provide round the clock services for inpatients like

  - Angiography & Embolisation for Gastrointestinal Bleeding,
  - Hemoptysis , Hematuria , Tumor Bleed , Intra/ Post Operative Bleeding
  - Drainage Procedures for Abscesses, Cholangitis,Obstructive Uropathy

- **Aims:**

  Upon completion of the Vascular/Interventional Radiology Fellowship Program, the fellow will be competent in and have developed expertise to perform Vascular/Interventional Radiology procedures using multiple imaging modalities. These include the ability to perform -

  - Diagnostic Angiography
  - Interventional Vascular Procedures (Vascular and Non-Vascular)
  - Biopsies (USG and CT guided)
  - Drainage Procedures
  - Venous Access
  - The fellow will also cover emergency cases at this site as part of the
  - Vascular/Interventional Radiology call schedule.

  The Fellow is expected to complete a project and at least two publications during the one and a half (24 months) year of training course.

- **Duration Of Course:**

  The structured course is designed for 24 months of training in the field of onco-intervention.

- **Evaluation:**

  The candidate's progress and conduct will be monitored and evaluated every year. The final evaluation in the training will be done at the end of course and the certificate awarded.

- **Infrastructure:**

  Machines

  - DSA: Innova-41 and machines.
  - Clinical MR scanner: GE- 1.5T
  - Multislice CT scanner: GE- Lightspeed 16 slice
  - 6 USG scanners including 3 dedicated Doppler Ultrasound machines with multiple linear, curvilinear and endocavitary probes
  - PET-CT scanner integrated with multislice CT scanner:

- **Duration and Rotation:**
  - DSA: 12 months (3 months x 4)
  - CT, CTA and CT guided procedures: 4 months
  - US and US guided procedures: 4 months
  - Doppler: 4 months

- **Supervision:**

  Initially, the fellow will be fully supervised by the Faculty posted in the area. In the course of training, the level of supervision will be tapered according to the experience and confidence gained.

- **On-Call:**

  We believe that attending to emergency and unscheduled cases outside duty hours is an essential part of training. The Fellow will be "Intervention on call" during the entire posting.

- **Selection Criteria:**

MD /DNB in Radiology, with minimum 1 year post-PG experience. Preference will be given to those who have worked in a teaching institute, tertiary hospital, candidates with previous exposure to intervention radiology and candidates already working in Tata Memorial Hospital. Selection will be based on a multimodality practical exam and interview.

- **Academic:**

  The Fellow will have to:

  - Undertake a project/dissertation and make at least two publications within the course period.
  - Present at one regional and one national conference at least.
  - Participate in the daily teaching sessions within the department, and make regular presentations.
  - Take part in Inter-departmental meetings relevant to the area posted.

- **Recognition:**

  TMC Recognition - On the successful completion of the course, the Fellow will be presented with a Certificate from the Department and Institution. We would also be working towards recognition from relevant State and National Imaging Associations.

- **Requirements:**

  - Applicants should be possessing a MCI recognized post-graduate qualification (M.D./ DNB) in radiodiagnosis.
  - Applicants should be below 35 years of age for General candidates and below 45 years of age for Sponsored candidates as on 31.08.2008.
  - Maximum of 2 candidates will be selected.
  - The training is residential and will last for eighteen months.
  - Persons working in the Govt. /Semi Govt. Organizations, Autonomous bodies should send their applications through proper channel
  - All foreign nationals are required **to get approval from Indian Embassy in their country and register with the Medical Council of India, New Delhi** before they will be accepted into the training program. They are advised to process their application well in advance. TMC can issue supporting documents to selected candidates.

- Preference will be given to doctors working in hospitals affiliated to the national cancer control program.