

Post-Doctoral Fellowship Course in
Thoracic Radiology
Department of Diagnostic and
Interventional Radiology



All India Institute of Medical Sciences (AIIMS)
Jodhpur, Rajasthan, India

PREAMBLE

Chest diseases are cause of morbidity and mortality worldwide. Frequently these patients have complex clinical problems, which require multidisciplinary approach for appropriate patient management and they need accurate diagnosis. Thoracic diseases and disorders still present a diagnostic dilemma for clinicians as well as general radiologists. The accuracy of clinical assessment is variable and depends upon clinical experience and support from various interdisciplinary departments. For this reason, there has justifiably been an increasing reliance on accurate diagnosis with the help of experts in thoracic imaging to guide management.

Lot of advancement also occurs in non-invasive cardiac imaging in past few years. The role of specialized thoracic radiologist also cannot be ignored in the setting of emergency and trauma. Due to this reason an accurate diagnosis thorough and logical approach is necessary.

Radiology is an expanding field in medicine. Applying for fellowship training positions in radiology is competitive. The field is rapidly expanding due to advances in computer technology, which is closely linked to modern imaging. Thoracic Radiologists must complete prerequisite postgraduate education in Radiology - MD or DNB in Radiology. Following completion of postgraduate training in Radiology, Radiologists may either begin practicing as a general Diagnostic Radiologist or enter into subspecialty training programs known as fellowships. Examples of subspecialty training in radiology include abdominal imaging, thoracic imaging, musculoskeletal imaging, interventional radiology, neuroradiology, interventional neuroradiology, pediatric radiology, nuclear medicine, emergency radiology, breast imaging and women's imaging. Fellowship training programs in radiology are usually one or two years in length.

Historically, thoracic scans have been performed and reported by general radiologists. New knowledge in imaging is being developed at an increasingly rapid rate. The field of radiology has expanded dramatically. The range of radiology covers diseases from the fetus through to the multi-morbid aging population, from prostate to the pituitary gland and from pancreatic neoplasia to bone dysplasia. No single person can master all the available knowledge. However, the referring physicians need a clinical interface with the imaging specialist. In order to create added value for the referring clinician, the radiologist must fully understand the clinical problem. The radiologist is expected to be able to do this at a different level and for all medical specialties. Therefore, adequate imaging experience and appropriate training in specific clinical specialties may also be needed.

The reasons for subspecialization in Radiology is (1) Information overload - Our field has become so complex that no individual can maintain the level of expertise needed to practice the entire field of radiology (2) Too rapid developments - complex

advanced scanners with new software, dual energy, functional imaging, spectroscopy, diffusion imaging, fusion imaging (3) specialized clinicians (4) Patients and clinicians require comprehensive information and the most accurate diagnosis (5) research.

Definition:

Fellows in Thoracic radiology will be fully qualified radiologists who have had further training in dedicated thoracic imaging and basic intervention which will be a one-year comprehensive, structured, fellowship comprising clinical, teaching, and research activity in all aspects of thoracic imaging and basic intervention using all available modalities.

Aim of the Training programme

The aim of this fellowship programme is to develop outstanding subspecialist radiologists with expertise in thoracic imaging to hit the ground running in their future practice. The candidate should also be capable of providing basic nonvascular and vascular interventional therapeutic service.

Syllabus of Post Doctoral Fellowship in Thoracic Radiology

Objectives

The structured training program would emphasize:

- Evidence-based decision-making.
- Development of desired technical expertise with emphasis on safety, self-analysis and improvement.
- Development of appropriate communication skills.
- Development of efficient interdisciplinary collaboration.
- Use of research technology and skills in conducting clinical and experimental studies.
- Development of professional leadership and management skills.
- Assess and treat patients having an anaphylactic reaction or an adverse side effect
- Teach residents and medical students as part of their daily assigned duties
- Perform and interpret examinations performed on-call
- Prepare thoracic imaging rounds once a month
- Attend all thoracic imaging rounds within the department as well as multidisciplinary rounds related to body imaging
- Attend a full weekly series of lectures prepared specifically for trainees at the fellowship level of expertise

TRAINING PROGRAMME SYLLABUS

A: General Principles:

Each Fellowship student is required to possess a comprehensive knowledge of the imaging modalities used in chest radiology and develop the skills to diagnose and further guide the patient for possible management options available. He/she should have personally performed a sufficient number of reporting both under supervision and independently and be able to diagnose common adult and paediatric pathologies.

He/she should also possess sufficient knowledge and experience in research methodology and development and is expected to complete a short research project during the tenure of his fellowship.

CLINICAL SKILLS FOR THORACIC RADIOLOGY FELLOWS:

A. Learning Objectives

- The thoracic radiology fellow will develop clinical expertise in the diagnosis and treatment of all diseases of the chest with special emphasis on the following areas : thoracic diseases, oncology, trauma, pre- and post-operative evaluations, diverse vascular doppler studies as well as other areas of cardiovascular and chest diseases that may be subject to imaging evaluation.
- Learn the latest advances and protocols in thoracic imaging with emphasis on a practical approach and problem solving to avoid common pitfalls.
- Become an expert at nonvascular image-guided interventions of the neck, chest.
- Assist in vascular interventions like bronchial artery embolisation.
- Show progressive knowledge and responsibility in interpretation and performance of studies, though these are done under the supervision of faculty radiologists.
- Develop the ability to teach radiology residents and medical students both informally and through participation in resident case conferences and medical student lectures.

B. Instructional/Teaching Activities

- Advanced didactic and interactive case-based curriculum contributed to by all the faculty members designed and tailored specifically for the thoracic radiology fellow.
- Weekly Journal Club.
- Regular divisional interesting case conferences where the best cases of the week are presented.
- Fellow oriented bimonthly interesting case conferences on thoracic imaging and HRCT lung following a topic based curriculum
- Interdepartmental Conferences:
 - Tumor Board meetings
 - Pulmonary radiology Conference
 - Nuclear medicine radiology Conference
 - Thoracic surgery radiology Conference
 - Grand Rounds
 - Clinico-radiologic-pathologic conferences.

Fellows are encouraged to participate in ongoing research projects or develop their own.

Duration and Rotation:

MRI - 3 months

CT - 6 months

USG including Doppler - 2 months

X-Rays and Special procedures - on regular case basis

OPD posting in Pulmonary medicine and Thoracic surgery

General medicine and infectious disease

Overview of training

Over the course of the one-year fellowship, the fellow will receive training in thoracic imaging with specific emphasis on the acquisition and interpretation of cross-sectional CT/MRI of the chest.

Additionally, the fellows will receive training in the interpretation of other imaging modalities including:

- CT of the abdomen, and pelvis
- 3D CT and MR reconstruction
- PET-CT
- Chest ultrasound and ultrasound-guided procedures
- Fluoroscopy
- Plain film interpretation of outpatients, inpatients, ICU, trauma radiography.

Fellows will also receive several didactic lectures in thoracic imaging, related vascular and interventional radiology, and PET/CT. Medical Imaging Grand Rounds and interdepartmental meetings add to the educational experience.

At the end of the one-year fellowship, the fellow should be able to demonstrate the following skills and competencies:

- Interpreting proficiently cross-sectional US, CT, and MR imaging of the chest - normal anatomy and thoracic pathologies.
- Performing and interpreting fluoroscopic procedures
- Comprehensive knowledge of the physics of ultrasound, CT, and MR imaging and an ability to apply this
- Performing image guided lung biopsy with management of complications of lung biopsy
- Performing nonvascular interventions e.g. percutaneous pleural catheter drainage, USG/ CT guided chest wall/ mediastinal masses/ pleural/ bone biopsies
- Knowledge for image optimization and for quality assurance issues
- Effective communication with other departments
- Patient care in the areas of consultation particularly in multidisciplinary conferences, patient safety, and diagnostic and therapeutic procedures
- Supervise CT and MRI examination and assess for absolute and relative contraindications, protocol each case appropriately, supervise technical adequacy and completeness of cases at the technologist's request.
- Quality control activities related to cross sectional imaging and patient care.

Throughout the year, fellows frequently interact with other medical services and are actively involved in several multidisciplinary conferences which include pulmonary, ICU, nuclear medicine, oncology. Frequently, these discussions focus on the accurate diagnosis and guide for further management.

Thoracic radiology fellows at AIIMS, Jodhpur will also be given the opportunity to participate in research activities. All trainees are required to participate in at least one scholarly project. Within the department, the fellows will be offered opportunities to participate in on-going basic and translational research. Clinical academic meetings for fellows will be held frequently. Fellows are encouraged to author publications and to present at meetings. All publications and presentations will be written with faculty guidance. If a fellow has a presentation accepted for a national conference, departmental funding may be provided if available.

The Library of AIIMS, Jodhpur supports the students, faculty, researchers, and clinicians in the Medical College. The library enables access to vast stores of biomedical literature (International and national journals). Good amount of reading books are also available in the library with computers for internet access.

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

- Regular academic sessions
- Case discussion and seminars
- Participate in the daily teaching sessions within the department and make regular presentations.
- Take part in Inter-departmental meetings relevant to the area posted.

Research:

The fellow will have to:

1. See 20 cases of quality analysing and discussing which will be certified by the faculty of the department.
2. Present at one regional and one national conference.

ASSESSMENT SYSTEM – As Per Institute Policy

Internal Assessment

Theory paper

Thoracic Imaging Specialty

Basic physics/contrast/techniques

Thoracic and vascular interventional radiology

Practical Examination

Components of Practical Examination

Component
Clinical Viva (2 cases)
Spotters
General thoracic Imaging Viva

Recommended Reading

Author Name	Name of the Book	Publishing Company
Miriam Sperber	Radiologic Diagnosis of Chest Disease	Springer
Lee and Sagel	Computed Body Tomography with MR Correlation	Wolters Kluwer
Haaga	CT and MRI of the Whole Body	Elsevier
Theresa C. McLoud	Thoracic Radiology: The Requisites	Elsevier
Webb , Muller, Naidich	High-Resolution CT of the Lung	Lippincott Williams and Wilkins
Webb, <u>Higgins</u>	Thoracic Imaging: Pulmonary and Cardiovascular Radiology	Lippincott Williams and Wilkins
Margulis & Burhenne's	Chest Radiology (Essentials Series)	Elsevier
Benjamin Felson	Chest Roentgenology	Atbs Publisher
Seaton	Crofton and Douglas's Respiratory Diseases	Oxford University Press
Hansell , Lynch, Bankier	Imaging of Diseases of the Chest	Elsevier
Goodman	Felson's Principles of Chest Roentgenology	Saunders
Grainger	Diagnostic Radiology 3 rd edition Vol - I	Churchill Livingstone
Grainger	Diagnostic Radiology 3 rd edition Vol - II	Churchill Livingstone

Grainger	Diagnostic Radiology 3 rd edition Vol - III	Churchill Livingstone
Zwiebel	Introduction to Vascular Ultrasonography. 3 rd edition.	Elsevier
<p>Latest Articles from National and International Journals particularly Journal of Thoracic Imaging, European Radiology, Radiology, radiographics, AJR, BJR, CPDR, Clinical Imaging, Seminars in Ultrasound, CT and MR, Radiologic Clinics of North America, MR Clinics of North America</p>		