

Aurora Health Care Radiology Residency

Goal and Objectives for Thoracic Imaging

Attending:

Location: St. Luke's Medical Center, Department of Radiology

Type: Fundamental Clinical Skills

Daily hours: 8:00 a.m. – 5:00 p.m., weekdays

Months Available: All

Rationale Statement: Residents will rotate through the Thoracic Imaging section during each of their four years of training. During this time, the resident will receive comprehensive education in diseases of the chest and gain competence in the interpretation of diagnostic imaging evaluations of the chest as well as the performance of thoracic interventional procedures. Residents will receive training in the clinical skills necessary to interpret plain film radiography of the chest, to supervise the performance of and interpret CT, high resolution CT, MRI and ultrasound of the thorax and perform image guided thoracic interventional procedures such as percutaneous lung biopsy, thoracentesis, and thoracostomy placement. All interventional procedures will be performed under the direct supervision of the staff radiologist. The level-specific residency goals and objectives for the Thoracic Imaging section are outlined below.

First Year Resident (PGY 2)

By the end of the PGY2 year, residents are expected to:

Medical Knowledge:

- Demonstrate a basic knowledge of the physics of radiography, computed **tomography** and ultrasound and have and apply a basic knowledge of radiation safety
- Demonstrate a basic understanding of contrast agents and adverse reactions and assist in the injection of contrast and treatment of reactions.
- Understand and identify normal anatomy and anatomic variants **of the thorax as seen on the chest radiograph, CT scan and ultrasound**
- Develop a systematic approach to the interpretation of chest radiographs and chest CT
- Demonstrate a basic knowledge of chest physiology and disease
- Recognize common abnormalities on a chest radiograph or chest CT
- Understand the pathophysiology and clinical significance of pulmonary embolism and readily recognize in on CT pulmonary angiography
- Understand the role of imaging techniques and modalities in the evaluation of chest disease and apply them appropriately in the management of patients
- Recognize and have a clear understanding of those radiographically **apparent conditions of the chest which require immediate notification of the clinician**

Patient Care:

- Gather accurate and pertinent patient information as it applies to the imaging study or procedure

- Learn basic components of image-guided interventional procedures of the thorax

Communication Skills:

- Compose a clear and concise radiology report.
- Act as an effective contact person for technologists, nurses and referring clinicians.
- Verbally communicate in a concise and clear fashion those radiographically apparent conditions of the chest, which require immediate notification of the clinician, including unexpected, urgent or life-threatening conditions.

Practice-based Learning and Improvement:

- Ask for and respond appropriately to feedback
- Apply principles of evidence-based medicine and decision making as it applies to thoracic imaging
- Review interesting cases with peers

Systems-based Practice:

- Understand the radiologist's role within the broader health care delivery system
- Work effectively as a resident member of the team.

Professionalism:

- Begin clinical assignments on time
- Treat peers, supervisors and ancillary staff with respect and cooperation
- Dictate and review reports in a timely fashion
- Treat patients and their families with respect and dignity

Second Year Resident (PGY 3)

By the end of the PGY3 year, residents are expected to:

Medical Knowledge.

- Recognize most abnormalities on a chest radiograph, chest CT or thoracic ultrasound
- Identify basic thoracic anatomy and normal anatomic variants on a thoracic MRI
- Identify normal anatomy on a High Resolution CT scan of the chest and understand appropriate indications for High Resolution Computed Tomography
- Demonstrate an understanding of the pathology of lung cancer and understand the role of imaging in the screening, diagnosis, staging and surveillance of lung cancer.
- Discuss various common diseases of the chest which give altered pulmonary patterns on the chest radiograph or chest CT
- Provide a ranked differential diagnosis for the common patterns of lung disease on chest radiography and thoracic CT

Patient Care:

- Participate in thoracic interventional procedures under direct staff radiologist's supervision
- Provide protocol for thoracic CT examinations, including High Resolution exams
- Review CT examinations with the technologists to ensure adequacy of examinations

- Assist in the administration of contrast and treatment of adverse effects when needed
- Review patient data, including pertinent previous imaging studies to ensure tailored, appropriate examinations

Communication Skills:

- Obtain informed patient consent for procedures and examinations, including clear communication of risks and alternatives
- Troubleshoot problems with nebulous orders and clarifications of exam indications with ordering physicians by telephone
- Verbally communicate examination findings to clinicians by telephone

Practice-based Learning and Improvement:

- Accepts feedback on performance and incorporates it to improve
- Reads and critically appraises relevant literature
- Reviews interesting cases with peers and radiologists
- **Initiates and seeks follow-up on cases by reviewing pathology, cytology, brochoscopy and follow-up imaging results**

Systems-based Practice:

- Understand the obligation of all health care professionals to curb health care costs by effective communication with colleagues and appropriate utilization of services
- Understands the fundamentals of billing and coding practices
- Understands patient privacy laws
- Attends multidisciplinary conferences

Professionalism:

- Maintains professional appearance and demeanor
- Treats patients and their families with respect, compassion and dignity
- Begins assignments on time
- Completes and reviews dictations in a timely fashion

Third Year Resident (PGY 4): By the end of the PGY4 year, residents are expected to:

Medical Knowledge.

- Identify abnormalities on High Resolution CT of the chest and participate in discussion of differential considerations with regard to interstitial lung disease
- Provide a comprehensive differential diagnosis for abnormal pulmonary patterns as seen on the chest radiograph or chest CT
- Displays thorough knowledge of lung cancer staging

Patient Care:

- Fully supervise the performance of a thoracic CT, High Resolution CT, or MRI of the thorax
- Perform a CT or fluoroscopic guided lung biopsy or ultrasound guided thoracentesis with full radiologist staff supervision

- Assist staff radiologist in thoracostomy placement and management

Communication Skills:

- Displays competence at writing pre-and post-procedure physician notes
- Functions effectively as a phone consultant
- Effectively counsels patients prior to interventional procedures

Practice-based Learning and Improvement:

- **Understands relevant practice guidelines with respect to lung cancer screening**
- Utilizes teaching resources for self-study
- Accepts responsibility for post-procedure patient follow-up

Systems-based Practice:

- Understands the importance of compliance in billing and coding practices and demonstrates this understanding by providing appropriate indications for examinations, technical details, including contrast information, and key language contained in reports
- Participates in multidisciplinary conferences

Professionalism:

- Maintains patient privacy
- Begins assignments and completes notes and dictations on time
- Understands and respects issues of patient, staff and colleague **diversity**

Fourth Year Resident (PGY 5): By the end of the PGY5 year, residents are expected to:

Medical Knowledge:

- Provide a comprehensive discussion and differential diagnosis for pathologic patterns identified on High Resolution CT of the lung
- Interpret chest radiographs and CT scans with a high level of accuracy and efficiency
- Perform lung cancer screening evaluations with a high level of accuracy

Patient Care:

- Demonstrate competence to perform an image guided percutaneous lung biopsy, thoracentesis and thoracostomy placement without supervision
- Displays competence at problem-solving and decision making with respect to the performance of CT, ultrasound and MRI examinations of the thorax
- Fully competent to treat contrast reaction and other procedural complications

Communication Skills:

- Fully competent to review and discuss examination results with patients and families by telephone or face to face. Displays verbal clarity, compassion, leadership and service
- Dictates clear concise reports
- Communicates effectively with referring clinicians and radiology staff

Practice-based Learning and Improvement:

- Evaluates own patient care practices and identifies areas for improvement
- Reads and critically evaluates relevant literature

Systems-based Practice:

- Works well and independently as a consultant
- Fully understands the radiologists role and works well as part of a health care team
- Understands health care financing issues
- Fully compliant with billing and coding practices

Professionalism:

- Demonstrates professional integrity
- Adheres to ethical principles
- Treats colleagues and other health care providers with respect
- Treats patients with respect and dignity

Recommended reading:

Imaging of Diseases of the Chest, by Armstrong, Wilson and Dee
Synopsis of Diseases of the Chest, by Fraser and Pare
Computed Tomography and Magnetic Imaging of the Whole Body, by Haaga, et al
High Resolution CT of the Lung, by Webb, Muler and Nadich

Core Conference Topics:

In addition to the required rotations thoracic imagining we have incorporated required conferences into the conference series.

- Normal radiographic and CT anatomy of the thorax
- Congenital disorders of the lung and airway
- Basic patterns in lung disease/radiographic signs in thoracic imagine/atelectasis
- Infections in the lung and pleura (I and II)
- Thoracic radiology in immunocompromised patient
- Chest trauma/emergency thoracic imaging
- Benign neoplasms of lung and chest wall
- Malignant neoplasms of the lung
- Malignant neoplasms of airway, pleura and chest wall
- Congestive heart failure and non-cardiogenic pulmonary edema
- Pulmonary heart failure and non-cardiogenic pulmonary edema
- Pulmonary embolism and pulmonary arterial hypertension
- Disorders of the thoracic aorta
- High resolution CT of the lung: technique/anatomy/lexicon/basic patterns of disease
- Interstitial lung disease I and II
- Pneumoconioses
- Immunologic diseases of the lung/connective tissue disorders
- Sarcoidosis and other pulmonary disease of unknown origins
- Pleura and benign pleural disorders
- Airway disease I

- Airway disease II: Asthma and hypersensitivity conditions
- Mediastinal and hilar disorders.

Evaluation and feedback:

Evaluations will be based upon the residents' performance in meeting rotation goals and objectives. Sources of evaluation will include the radiology preceptor and other radiology staff. Emphasis will be placed on the residents' attendance and promptness in the assigned radiology departments, performance on the open test, and ability to function as an effective consultant in conferences.

Feedback will be provided on a day-to-day basis by the radiology faculty. Cumulative evaluation will be provided through the completion of the standard AHC radiology evaluation at the end of the rotation. This evaluation will be reviewed and discussed with the resident by the rotation preceptor, and will ultimately be reviewed and discussed with by the residents' academic advisor during quarterly review sessions.

As a program we need your feedback regarding faculty performance as instructors and supervisors, and your feedback regarding the ability of the rotation to meet educational goals. At the end of the rotation you will be required to complete a rotation evaluation in E-value. On a quarterly basis you will be required to confidentially evaluation the faculty members' teaching abilities. We are requiring these evaluations so we have data to use in program and rotation maintenance and improvement. During quarterly performance evaluations/advisor meetings, the resident's evaluations of the rotation and preceptors are discussed.