

Radiology Rotation Educational Goals & Objectives for Family Medicine

Family Medicine physicians provide continuing care for patients with a myriad of medical and psychosocial problems. During many patient encounters, the focus is on the diagnosis and treatment of illness. This endeavor frequently involves the use of imaging or interventional radiology procedures. As such, it is important for residents to gain experience in the proper ordering and interpretation of imaging and procedural studies. The Radiology rotation will provide the resident with an opportunity to learn normal and abnormal anatomy, recognize radiographic findings of common diseases, understand the indications for commonly ordered imaging studies, and learn the appropriate use of interventional procedures. The goal of the rotation is to help the resident become competent in the cost-effective use of radiology in the evaluation and treatment of disease.

Faculty will facilitate learning in the 6 core competencies as follows:

Patient Care and Procedural Skills

- I. All residents must be able to provide compassionate, culturally-sensitive, and appropriate care for patients in the course of evaluating and treating disease.
- II. Residents will develop a **fundamental knowledge of the components of a history and physical exam, which constitute a viable, billable indication, which will become increasingly important in professional practice in the face of the ever-changing ICD system.**

PGY2s should also be able to recognize the contribution of comorbidities and medications to a patient's risk for complications with an interventional procedure.

PGY3s should be able to independently obtain a brief history and physical for patients with a complex history of multiple comorbid conditions undergoing procedures.

- III. Residents should become familiar with the indications, contraindications, complications, limitations, alternatives and interpretation of following studies:
 - PGY1s
 - X-rays – chest, abdomen, pelvis/hip, spine, and extremities
 - GI studies - barium enema, upper GI, esophagram
 - CT – brain, chest, abdomen, pelvis
 - MRI – brain
 - Ultrasound – abdomen, pelvis, renal, lower extremity veins
 - PGY2s
 - CT – cardiac, extremities, CT angiography, spine, sinuses
 - Ultrasound – obstetric, vascular, thyroid, breast
 - MR – spine, extremities, abdomen, pelvis, MRCP, MR angiography.

- PGY3s
 - Interventional Radiology – angiography and vascular interventions, nephrostomy, gastric tube placement, vertebral augmentation, TIPS

IV. All residents should be able to **understand the role of imaging-guidance to facilitate common radiological procedures.**

All residents will become familiar with the following radiologically-guided procedures (and may take part as is appropriate given level of training and experience):

- Lumbar puncture with fluoroscopic guidance
- Ultrasound guided paracentesis and thoracentesis
- Use of ultrasound for central line placement
- CT and ultrasound guided biopsies and drainages

PGY1s will also develop skill in use of point-of-care ultrasound, when possible, in the following areas:

- Abdomen – identify ascites, common locations for ascites collection, largest fluid pocket, and safest locations for paracentesis
- Right upper quadrant abdomen – identify gallbladder; diagnose or exclude cholelithiasis; assess sonographic Murphy's sign
- Chest – identify pleural effusion, location of lung, and safest location for thoracentesis; identify pneumothorax
- Vascular – identify jugular vein, common femoral vein; differentiate vein from artery; check patency
- Renal – evaluate for presence/absence of hydronephrosis
- Bladder – estimate bladder urine volume

Medical Knowledge

- I. PGY1s will develop an understanding of the appropriate use of diagnostic imaging for patients with the following presenting conditions:
- Acute abdomen
 - Back or neck pain with and without neurologic findings
 - Chest pain with suspicion of aortic dissection
 - Hematuria and flank pain
 - History of an isolated pulmonary or adrenal nodule
 - Neurologic symptoms, including headache, focal sensory or motor findings, mental status changes, paresthesias, seizures, and symptoms of cord compression
 - Pulsatile and non-pulsatile abdominal masses
 - Suspected pulmonary embolism
 - Swollen leg or arm
 - Trauma
 - Vaginal bleeding

PGY2s will also understand the use of imaging to evaluate patients with commonly seen illnesses, such as congestive heart failure, pneumonia, COPD, and interstitial lung disease, and to evaluate and treat such conditions as cancer and GI bleeding.

PGY3s will understand appropriate study selection, and timing and sequencing of studies to enhance diagnostic value. They will be able to interpret results within the context of patient comorbidities, pretest probability of disease, and sensitivity and specificity of the study.

Practice-Based Learning and Improvement

- I. Residents should be able to use PACS to access radiology studies.
- II. All residents should be able to access current national guidelines to apply evidence-based strategies to the appropriate use of radiologic studies and procedures.
- III. PGY2s and PGY3s should develop progressive independence in understanding studies aimed at evaluating the utility of imaging and interventional techniques in patient care, through Journal Club and independent study.
- IV. All residents should participate in case-based decision-making, involving the primary care provider, radiologist and other specialists where appropriate.
- V. Residents should learn to coordinate patient care as part of a larger team, involving nurses, technicians, and other health professionals to optimize patient care.
- VI. All residents should respond with positive changes to feedback from members of the health care team.

Interpersonal and Communication Skills

- I. All residents must demonstrate organized and articulate electronic and verbal communication skills that build rapport with patients and families, convey information to other health care professionals, and provide timely documentation in the chart.
- II. Residents should understand and comply with HIPPA with respect to use of health information.
- III. PGY3s should also demonstrate leadership skills in helping to work with the patient and their primary provider to coordinate a treatment plan.
- IV. PGY3s must be able to obtain consent for procedures in situations with complex social dynamics, for example, when identifying the power of attorney or surrogate decision maker is required.

Professionalism

- I. All residents must demonstrate strong commitment to carrying out professional responsibilities as reflected in their conduct, ethical behavior, attire, interactions with colleagues and community, and devotion to patient care.
- II. PGY1s should be able to educate patients and their families in a manner respectful of gender, age, culture, race, religion, disabilities, national origin, socioeconomic status, and sexual orientation on choices regarding their care.
- III. PGY2s should be able to counsel patients and families on diagnostic and treatment decisions involving imaging studies and procedures.

- IV. PGY3s should be able to provide constructive criticism and feedback to more junior members of the team.

Systems-Based Practice

- I. PGY1s must have a basic understanding that their diagnostic and treatment decisions involve cost and risk and affect quality of care.
- II. PGY2s must be able to identify current quality issues in radiology and primary care, such as the use of CT scans to screen for lung cancer.
- III. PGY3s must also demonstrate an awareness of alternatives in discussing interventional procedures and their costs, risks, and benefits.

Teaching Methods

- I. Supervised reading of imaging studies and supervised performance of interventional procedures in the radiology department or outpatient facility.
 - Initial emphasis will be on identifying key diagnostic findings in commonly ordered imaging studies
 - When residents have mastered these skills, focus will be on medical decision-making and procedural skill
- II. Conferences
 - Specialty-specific didactics
- III. Independent study
 - Journal and Textbook reading TBD by radiology attending
 - Online educational resources
 - Atlas of Radiological Images
http://www.meddean.luc.edu/lumen/MedEd/Radio/curriculum/Harrisons/Harrisons_f.htm
 - The following resources were developed by various subspecialty organizations but provide an excellent initial foundation for all learners:
 - <https://www.aium.org/communities/emergency.aspx>
 - <https://www.acponline.org/cme-moc/online-learning-center/point-of-care-ultrasound-for-the-internist>
 - Up to Date
 - Clinical Key

Evaluation

- I. Verbal mid-rotation individual feedback
- II. Attending written evaluation of resident at the end of the month based on rotation observations and chart review.

Rotation Structure

- I. Residents should contact the radiologist attending 1-3 days prior to the rotation start date to determine start time and location.
 - In general, the hours of the rotation are 0800-1500 Monday through Friday.
 - To help residents gain skills in point-of-care ultrasound (POCUS), residents will complete a **Point of Care Ultrasound (POCUS) Skills Assessment**. They should obtain this checklist from their Program Coordinator prior to the start of the rotation. Residents will spend at least 4 hours a week with a sonographer, initially 2 afternoons per week 3-5 pm as directed by the radiology attending until these skills have been achieved. Residents can choose to spend more time and/or pursue additional skills if desired. Residents who do not complete the checklist may continue to work on skills in other venues, particularly in the ED. Some skills on the checklist are specific to the ED, and residents should work to learn those skills on that rotation. *When residents complete the checklist, they should return it to their Program Coordinator.*
 - **Residents should check out the hand held/bedside unit from the GME office at the start of the rotation**, since this unit or a similar unit is what is available on the floors and in the clinic. **Residents should learn how this works prior to starting their Radiology rotation** since the radiologists and sonographers will not be familiar with this unit
- II. Residents may be working with several radiologists during the rotation as well as with the sonographers. All of the radiologists are expected to be involved in resident teaching.
- III. Residents will be dividing their time between the reading room, case review, and procedure suites as appropriate. Residents may be rotating through the CMH outpatient office, CMH breast center, and the nuclear medicine department as well as the Department of Radiology.
 - Rotations are expected to be a “hands-on” experience. Residents will be involved in discussion of study appropriateness, image interpretation, and creation of a differential diagnosis. In addition, residents will be involved in radiological procedures as is appropriate.
 - Case-based learning is most effective. Nightly reading/study should be based on cases reviewed during the day.
 - Residents may be asked to do focused literature searches or presentations during the course of the rotation.
 - Residents may be asked to communicate with patients, family members, primary care providers, and consulting providers as is appropriate. Discretion and decorum is always paramount.
- IV. Any call and weekend responsibilities TBD by the attending physician.
 - Hours worked must be consistent with ACGME requirements and are subject to approval by the Program Director.
- V. Residents have specialty-specific didactics and should be excused in a timely fashion to attend.