Resident Core Curriculum

1590 Night Float/Emergency Radiology

General Goals: The specific goals include objectives required for every level of training with graduated levels of supervision and responsibility. Multiple modalities are incorporated into the on call residency, including Body CT, Neck CT, ultrasound consultation, emergency room radiography, and nuclear medicine. During every training rotation, the resident will read the required literature and study the associated radiology teaching file. Over time, the resident will become progressively more knowledgeable about normal radiographic anatomy and the radiological appearances of diseases. In addition, the resident will demonstrate a progressive increasingly understanding of disease entities, their clinical presentations, and current modes of treatment. There are two concurrent rotations for second and third year residents for the 1590 Night Float.

Resident Daily Work Responsibilities (OVERALL BENCHMARKS/OBJECTIVES for Self-Evaluation)

1. Residents assigned to 1590 Night Float will be available for consultations by technologists, clinicians, and other health care providers.
2. Resident questions will be referred to the supervising faculty covering the on call division of radiology that is in question.
3. Resident review of cases with the supervising faculty will be conducted as many times in the day as necessary to keep an efficient workflow.
4. All resident examinations will be dictated by the end of every work shift.
5. Residents will check and sign his/her reports before leaving prior to final verification by supervising faculty.
6. Residents must be familiar with the operation of all imaging equipment.
7. Residents must acquire knowledge of radiation protection and ways to reduce radiation exposure to both patients and hospital personnel. The resident will be supervised to assure that safe practices are followed.
8. Residents will check examinations before the patient leaves the department if requested to do so by the supervising faculty.
9. Residents must become proficient at detecting abnormalities demonstrated by plain films and contrast examinations and be able to generate meaningful differential diagnosis.
10. Residents will become knowledgeable about the use of different radiographic contrast agents (including their indications, contraindications, dosages, and side effects).
11. Residents will acquire an understanding of the proper preparation of patients for examinations and appropriate follow-up afterward. At the start of every working day, the resident will be familiar with the patient schedule and anticipate need for any procedures. The resident will check requisitions for the next working day to evaluate for appropriateness of the requested procedure or if additional exams/protocols need to be performed. Absent clinical indication or seemingly inappropriate requests will be clarified and discussed with the referring physician.

12. Residents will do in-depth reading and study, along with a review of teaching file cases, to become knowledgeable about normal anatomy and physiology, the radiologic appearances of diseases, and gain a general understanding of the disease entities, their clinical presentations, and certain modes of treatment.
13. Residents will serve as a secondary consultant to referring physicians regarding imaging. This will strengthen the confidence of the resident in the very important role every radiologist must perform throughout his/her career as a consultant to clinicians.
14. Residents will become prepared to pass the certifying examination of the American Board of Radiology.
15. Residents will teach and share knowledge to medical students, radiologic technologist students, and junior residents.
16. Residents will participate in the preparation and presentation of imaging studies at the monthly Interesting Case Conference.

Supervising Faculty Responsibilities:

1. Supervising faculty on call will be available at all times for any questions or consultations needed by the resident.
2. Supervising faculty will review all cases with the residents before or at the end of the shift.
3. Supervising faculty will provide the resident with constructive feedback in any problem areas encountered during the rotation.
4. Supervising faculty will verify resident-generated reports in a timely manner and inform the resident of any major changes made.

Educational Goals and Objectives (Second Year Residents):

Patient Care:

- Adequately explain each examination to the patient in order to ensure that the patient feels comfortable and to provide patient care that is compassionate, appropriate, and effective
- Aware of the basic principles of radiation protection in order to reduce as much as possible the radiation dose to the patient and reduce exposure to healthcare providers
- Understand the indications for and contraindications to use of intravenous radiographic contrast, and be able to monitor its administration
- Recognize and treat reactions to intravenous contrast
- Understand the indications and contraindications to the different types of contrast, dosages, side effects, and the differences and relative merits of single and double contrast studies.
- Develop a knowledge of the preparation and aftercare required for the common examinations
- Use the PACS, voice recognition systems, and hospital information systems to become proficient in dictating reports of significant radiographic findings in a concise and clear manner

- Demonstrate the ability to recommend additional imaging studies as appropriate to better assess findings on imaging studies
- Make decisions when to alert house staff to the immediacy of a condition that is apparent on the radiograph
- Determine the need for repeat or additional radiologic examinations/studies
- Assist the junior call resident (1404 night float) with challenging cases in emergency radiography, neuroradiology, fluoroscopy/gastrointestinal radiography, musculoskeletal radiology, and urgent nuclear medicine studies

Medical Knowledge:

- Demonstrate knowledge and competency in protocoling and interpreting CT of the chest, abdomen, pelvis, neck, and ultrasound medicine exams/studies
- Body CT: Identify any intrathoracic, intraabdominal or intrapelvic abnormality that results from trauma, inflammation, surgical intervention, or from a congenital or acquired condition, as well as neoplastic processes in both the adult and pediatric population
- CT Pulmonary Angiography: Identify abnormalities and normal variants in pulmonary arterial anatomy, inflammatory and neoplastic processes, pulmonary embolisms on CT pulmonary angiograms in both the adult and pediatric population
- Ultrasound: Interpret venous Doppler, pelvic, renal, and abdominal ultrasounds. Identify abnormalities that arise from trauma, inflammation, congenital or acquired conditions, ectopic pregnancies and other abnormalities of the first trimester. Evaluate renal, hepatic, and pancreatic transplants, TIPS, abdominal aorta for aneurysm in both the adult and pediatric population. If time allows, assist in clinical services performing thoracenteses or paracenteses
- Nuclear Medicine: Provide preliminary reading on ventilation/perfusion scans and confer with the attending on call
- Communicate verbally with referring physicians and house staff about radiographic findings
- Become knowledgeable about the different contrast agents available and begin to recognize abnormalities that are demonstrated on plain radiographs and other imaging technologies
- List the risk factors for allergic reaction to intravenous contrast media
- State the proper assessment and treatment for allergic reactions to contrast media
- Recognize the more common abnormalities encountered during body and neck CTs, ultrasounds, and nuclear medicine.
- Develop a knowledge of the differential diagnoses of the more commonly encountered abnormalities
- Demonstrate the ability to recognize and describe common medical conditions depicted on imaging studies
- Recognize critical findings on emergency imaging evaluations

Practice-Based Learning and Improvement:

- Show evidence of independent study using textbooks from reading list
- Demonstrate appropriate follow up of interesting cases
- Research interesting cases as directed by faculty

- Identify, rectify, and learn from personal errors
- Incorporate feedback into improved performance
- Efficiently use electronic and print sources to access information

Interpersonal and Communication Skills:

- Communicate with the patient in as caring and compassionate manner at all times during the examination to ensure that patient remains comfortable
- Communicate effectively with all members of the health care team (technologists, medical students, fellows, residents, allied health providers, support staff, and attending physicians/radiologists)
- Call results to the referring physicians and show ability to interact with referring physicians
- Interact with clinicians when reviewing cases involving radiographs and imaging studies and show ability to provide preliminary readings, follow up with attending radiologists, formulate a plan of complex cases, and communicate any changes to referring clinicians
- Recognize limitations and ask for help when needed

Professionalism:

- Demonstrate respect for patients, families, and all members of the healthcare team and be able to discuss significant radiology findings
- Explain the impact of the radiology findings on patient care, including what imaging studies may/may not be appropriate
- Respect patient confidentiality at all times
- Present oneself as a professional in appearance and communication
- Demonstrate a responsible work ethic with regard to work assignments

System-Based Practice:

- Able and willing to participate in clinical conferences in which imaging studies are used to guide patient care/evaluations and be able to demonstrate understanding of how imaging relates to the clinical care of the patient
- Demonstrate knowledge of the ACR practice guidelines and technical standards
- Demonstrate knowledge of ACR appropriateness criteria and cost effective imaging evaluation of common disorders
- Show ability to interact with clinicians regarding cost effective and streamlined evaluation for differing clinical entities

Monitoring and Assessment of Resident Performance

The resident's progress will be monitored by the faculty on the service. Toward the end of each rotation, the resident will receive an evaluation of performance from each attending. Deficiencies or substandard performance will be discussed personally and privately with the resident and will be brought to the attention of the Residency Program Director by the attending radiologist. Residents are evaluated monthly by faculty. Resident performance is also evaluated through direct observation, case logs, multi-source professional evaluations, structured case

discussion, review of patient outcomes, and other performance evaluation methods as determined.

Educational Goals and Objectives (Third Year Residents):

The objectives above as well as the following:

Patient Care:

- Understand the physics of radiation protection and how to apply it to routine studies
- Obtain consent for more complex procedures and answer all questions the patient may have
- Develop a knowledge of the preparation and aftercare required for more complex procedures
- Continue to improve skills for performing radiographic examinations, and tailor examinations to answer all questions being asked by the clinician; anticipate those questions that should have been asked but were not
- Demonstrate knowledge of indications for the examinations requested (when the reason for the examination is not clear, the resident will effectively communicate with the patient and referring physician until clarified)
- Familiarity with available medical records and how to access them for the purposes of patient care
- Protocol cases, in consultation with the attending, to assure that the examination is appropriate and of sufficient quality to address the clinical concerns of the patient and referring physician
- Review all studies with the supervisor faculty attending
- Provide preliminary reports to all referring clinicians if needed before the final review of cases (when there is a significant discrepancy between the preliminary reading and final reading, the resident will notify the referring clinician immediately)
- Read all Body CT studies (chest, abdomen, and pelvis)
- Read all ultrasound studies with the preliminary reports sent to the ultrasound attending's queue on day of the check out
- Read all CTA/CTPA studies while 1232 resident is not in-house and send all reports directly to the on-call NICV attending's queue
- Read all nuclear medicine studies and dictate preliminary report and send it to the on call attending's queue. Resident will speak with clinical team to determine urgency of study. If unsure, the resident will page the on call Nuclear medicine faculty
- Provide preliminary verbal interpretation of all urgent/emergent after hours MRI studies while 1232 resident is not in-house. **The Neuro or MSK fellow should be contacted for any MRI studies that the resident does not feel qualified to read** If urgent findings were communicated, write on requisition paper and deliver to the appropriate reading room.
- Review all after hours requests for myelograms or fluoro-guided LPs. Determine if study is appropriate and if clinically feasible (coags, consent, 300 lb weight limit). Directly contact 1232 resident to perform procedure.
- Protocol all urgent/emergent MR studies while the 1232 resident is not in-house. Page the 1232 resident with questions regarding protocols and the Neuro/MSK fellow if necessary.

- **If there are any questions regarding a study, page the TAB faculty on call.**

Medical Knowledge:

- Recommend the appropriate study based on the clinical scenario and understand the relative strengths of each modality
- Familiarity with the anatomy of the organs examined in every case
- Familiarity with imaging findings of common acute and chronic chest, abdomen, pelvis, neck exams/studies evaluated with CTs and those associated with ultrasound medicine
- Identify pathology in order to interpret routine imaging studies with accuracy appropriateness to the level of training when presenting to the attending
- Distinguish between normal and abnormal chest, abdomen, pelvis, neck anatomy to level of training when presenting to the attending
- Distinguish and provide a differential diagnosis for abnormalities encountered for Body CT, CT Pulmonary angiography, ultrasound, and nuclear medicine
- Nuclear Medicine: Provide reading on ventilation/perfusion scans and confer with the attending on call. Identify acute renal failure, rental tubular acidosis, and urine leak following renal transplantation, acute cholecystitis, and GI bleeding.

Practice-Based Learning and Improvement:

- Identify, rectify and learn from personal errors
- Incorporate feedback into improved performance
- Demonstrate evidence of independent reading and learning through use of printed and electronic resources
- Follow up on abnormal or interesting cases through personal communication with the referring physician or patient medical records
- Competent in using PACS, voice recognition systems, and the patient information systems in the daily accomplishment of the workload and instruct others in their use
- Competent in performing and interpreting Body CT, Neck CT, and ultrasound examinations

Interpersonal and Communication Skills:

- Appropriately obtain informed consent
- Produce concise reports that include all relevant information
- Communicate effectively with all members of the healthcare team
- Communicate effectively the results of studies to referring clinicians whenever needed (for emergent studies, this will be accomplished in a timely manner)
- Effectively convey the findings of examinations through accurate dictation of reports
- Assist the junior call resident (1404 Night Float) with challenging cases in emergency radiography, neuroradiology, fluoroscopy, gastrointestinal radiography, musculoskeletal radiology, and urgent nuclear medicine studies

Professionalism:

- Demonstrate respect for patients and all members of the healthcare team (technologists, nurses, and other healthcare workers)
- Respect patient confidentiality at all times

- Present oneself as a professional in appearance and communication
- Demonstrate a responsible work ethic in regard to work assignments
- Explain the nature of the examination or findings in an examination to patients and their families when needed
- Observe ethical principles when recommending further work-up
- Promptness and availability at work are required of every resident
- Dress appropriately for work

Systems-Based Practice:

- Demonstrate knowledge of ACR practice guidelines and technical standards
- Demonstrate knowledge of ACR appropriateness criteria and cost-effective imaging evaluations
- Become familiar with departmental procedures, contrast safety, and sedation required in the performance of examinations
- Use appropriate language in communicating to clinicians through reports or consultations so proper management decisions can be made
- Thorough dictations will be made with indications, techniques, findings, and conclusions
- Dictate and correct reports in a timely fashion to avoid delay in patient disposition
- Make suggestions to improve methods and systems utilized in radiology whenever appropriate

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