

Resident Core Curriculum

Thoraco-Abdominal: Genitourinary (GU)

General Goals: The specific goals include objectives required for every level of training with graduated levels of supervision and responsibility. All aspects of thoracoabdominal imaging are incorporated into the residency, with a focus on genitourinary. During every training rotation, the resident will read the required literature and study the teaching file in thoracoabdominal and genitourinary radiology. Over time, the resident will become progressively more knowledgeable about normal radiographic anatomy, physiology of organs, and the radiological appearances of diseases. In addition, the resident will demonstrate a progressively increasing understanding of disease entities, their clinical presentations, and current modes of treatment.

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

1. Residents assigned to thoracoabdominal imaging will be available for consultations by technologists, clinicians, and other health care providers, except during conference times, when the attending faculty will cover.
2. Resident questions will be referred to the supervising faculty covering thoracoabdominal radiology.
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 working day.
5. Residents will check and sign his/her reports 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 learn techniques for performing high quality, state-of-the art diagnostic examinations throughout the body, but especially the genitourinary tract. Examinations will be checked 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 thoracoabdominal plain films and contrast examinations; 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 the normal anatomy and physiology of organs and the radiologic appearances of genitourinary 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 thoracoabdominal 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 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 the end of the day.
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 (First 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
- Familiarity with the operation of imaging equipment
- 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 genitourinary imaging studies

Medical Knowledge:

- Learn the basic physics of radiography
- Observe and learn the techniques to achieve high-quality diagnostic examinations of the genitourinary system
- Develop a knowledge of the normal and abnormal anatomy of the genitourinary tract as demonstrated on contrast studies
- Become knowledgeable about the different contrast agents available and begin to recognize abnormalities that are demonstrated on abdominal plain radiographs and contrast studies of the genitourinary
- State the physiological properties, proper concentrations and proper indications for the use of the following contrast material: ionic intravenous contrast media; non-ionic intravenous contrast media; list the high risk factors for allergic reaction to intravenous contrast media; state the proper assessment and treatment for allergic reactions to contrast media; recognize the normal radiographic appearance of structures of the genitourinary tract; list issues related to IV contrast agents in breastfeeding mothers
- List the risk factors for allergic reaction to intravenous contrast media
- State the proper assessment and treatment for allergic reactions to contrast media
- 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 thoracoabdominal and genitourinary imaging studies

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 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 genitourinary 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

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 for thoracoabdominal imaging
- 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 (Second 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 genitourinary 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)

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 genitourinary diseases
- Identify pathology in order to interpret routine imaging studies with accuracy appropriate to the level of training when presenting to the attending
- Distinguish between normal and abnormal genitourinary anatomy to level of training when presenting to the attending
- Detect abnormalities while procedures are in progress, such as 1) disease recognition skills will continue to increase on genitourinary plain radiographs and contrast studies, and 2) begin to develop meaningful differential diagnoses for the pathology that is found
- Perform and interpret: Cystogram; Voiding cystourethrogram; Renal ultrasound; Scrotal ultrasound; Stone protocol CT; Renal mass protocol CT; CT IVP (CT urogram)

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
- Review patient history for whom procedure has been ordered and determine appropriateness of the study requested and whether proper protocols were followed

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

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 for genitourinary imaging
- Demonstrate knowledge of ACR appropriateness criteria and cost-effective imaging evaluation of genitourinary disorders
- Familiarity 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

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 above objectives as well as the following:

Patient Care:

- Familiarity with the utility of contrast studies of the genitourinary tracts, and their relationship to other imaging modalities
- Perfect diagnostic examination techniques and be very skilled and efficient in performing and interpreting all diagnostic examinations performed
- 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 or 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 supervising 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)

Medical Knowledge:

- Develop a thorough knowledge of the differential diagnosis of abnormalities encountered
- Relate the imaging findings to the clinical condition and its pathology
- Understand the clinical management of the conditions encountered
- Familiarity with the anatomy of the organs examined in every case
- Familiarity with imaging findings of common acute and chronic genitourinary diseases
- Identify pathology in order to interpret imaging studies with accuracy appropriateness to the level of training when presenting to the attending
- Distinguish between normal and abnormal genitourinary anatomy with excellent accuracy according to the level of training when presenting to the attending and demonstrate improvement compared to the prior rotation
- Become proficient in detecting abnormalities on plain radiographs and other imaging modality studies while in progress
- Development of appropriate differential diagnostic lists will be well advanced
- Know the proper preparation of patients for diagnostic examinations and the appropriate follow-up afterwards
- Act as a consultant in thoracoabdominal and genitourinary radiology to the clinical services
- Obtain a broad understanding of abdominal and genitourinary tract diseases, their clinical features, radiographic manifestations, and current modes of treatment
- Discuss the proper clinical and radiologic indications for the following studies as well as demonstrate knowledge of proper KV techniques, patient positioning, and type of after-films for: Cystogram; Voiding cystourethrogram; Retrograde urethrogram; Retrograde pyelogram; Video urodynamics; Renal ultrasound; Scrotal ultrasound; Renal mass protocol CT; CT-IVP (CT-Urogram); Stone protocol CT; MR renal mass; MR urogram.

Practice-Based Learning and Improvement:

- Identify, rectify, and learn from personal errors
- Incorporate feedback into improve 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

Interpersonal Skills:

- Appropriately communicate results to patients and clinicians whenever needed (for emergent studies, this will be done in a timely manner)
- Produce concise reports that include all relevant information and be able to effectively convey the findings of examinations through accurate dictation of reports
- Communicate effectively with all members of the healthcare team
- Assist with supervision and teaching of medical and radiology technologist students

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 of findings in an examination to patients and their families when needed
- Observe ethical principles when recommending further work-up for cases
- Promptness and availability at work are required of every resident
- Dress appropriately when reporting to work

Systems-Based Practice:

- Demonstrate knowledge of ACR practice guidelines and technical standards for genitourinary
- Demonstrate knowledge of ACR appropriateness criteria and cost effective imaging practices
- Complete final preparations to pass the certifying examination of the American Board of Radiology
- Familiarity 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
- Produce thorough dictations 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

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.

Reading List for All Years

1. Robert Older and Matthew Bassignani. *Teaching Atlas of Urologic Imaging*. Thieme, 1st Edition, 2008
2. N. Reed Dunnick, Carl M. Sandler, Jeffrey H. Newhouse, and E. Stephen Amis. *Textbook of Uroradiology*. Lippincott Williams & Wilkins, 4th Edition, 2007
3. Ronald J. Zagoria. *Genitourinary Radiology: Radiology Requisites Series*. Mosby, 2nd Edition, 2004
4. William Brant and Clyde A. Helms. *Fundamentals of Diagnostic Radiology*. Lippincott Williams & Wilkins, 3rd Edition, 2007

"Required" Reading for All Years

Listed below are specific sections which are particularly well done, and will be read during the two month period on the Uroradiology rotation.

1. William E. Brant and Clyde A. Helms. *Fundamentals of Diagnostic Radiology*, Lippincott Williams & Wilkins, 3rd Edition, 2007
 1. Genitourinary Tract
 1. Chapter 33 Adrenal Glands and Kidneys
 2. Chapter 34 Pelvic/lyceal System, Ureters, Bladder, Urethra
 3. Chapter 35 Genital Tract Radiographic Imaging and MR
2. N. Reed Dunnick, Carl M. Sandler, Jeffrey H. Newhouse, and E. Stephen Amis. *Textbook of Uroradiology*. Lippincott Williams & Wilkins, 4th Edition, 2007
 1. Chapters 1-21

Other Requirements/Expectations

Teaching Materials

GU CDs (see Radiology Librarian)

Photo-CD: *Introduction to IVP, Contrast Media, Urinary Tract Infection, Scrotal Ultrasound,

GU Case Review

CD-ROM (available in Radiology Library): *Contrast Media An Interactive Program, *GU Imaging Part I, *GU Imaging Part II, GU Ultrasound

- Most Important

Ronald J. Zagoria MD, William W. Mayo-Smith MD, and Julia R. Fielding MD. *Genitourinary Imaging: Case Review Series*. Mosby, 2 Edition, 2006

Internet: www.uroradiology.net-interactive GU cases and programs
STATDx

Core Knowledge Presentation Topics for a Two Year Cycle

The Abdominal Film-Normal and Abnormal
Contrast Media

Upper Tract Imaging: Normal and Abnormal

Lower Tract Imaging: Normal and Abnormal

Urinary Tract Infection

Urinary Tract Obstruction and Dilatation

Urinary Stone Disease- Diagnosis and Treatment

Cystic Disease of the Kidneys

The Difficult Renal Mass

Tumors of the Renal Collecting System, Ureters and Bladder

Urinary Tract Trauma

Renal Vascular Abnormalities

Abnormalities of the Scrotum and Contents

Disorders of the Adrenal Glands

Differential Diagnosis of Filling Defects of the Urinary Bladder, Bilateral Large and Small Kidneys, Unilateral Small and Large Kidney, Displacement of the Upper and Lower Urinary Tract

Staging of Urological Malignancy-Multimodality Approach

Updated 6/25/2009; Revised 05/02/2011