Course: Diagnostic Radiology Course Number RAD 2101

Department: Radiology

Faculty Coordinator: Kristen Bishop, MD

Hospital: Clements University Hospital, Parkland Health and Hospital System, Children's Health

Periods Offered: 1-4; 7-12

Length: 4 weeks

Max # of Students: 1-3 (12 Students Max); 4,7-12 (24 students Max)

First Day Contact: Alejandro Calderon Lopez

First Contact Time: 8:00 a.m.

First Day Location: Charles Sprague Building, CS0.407

I. **Course Description**

During your four weeks you will be exposed to a broad cross-section of what Radiology entails and how it can help you care for your patients regardless of the specialty you choose to pursue.

Goals	Objectives	Assessment methods
Patient Care: *To provide patient care that is compassionate, appropriate, and effective for the treatment of health problems.*	**1.** Name the advantages and drawbacks of various radiologic modalities and their roles in diagnosis and care of the individual patient **2.** Select the most appropriate imaging modality for a given patient scenario using the ACR Appropriateness Criteria	• *Quality of Medical Records entries* • *Skills evaluation from direct observation.*
Medical knowledge: *To demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care.*	**1.** Identify normal anatomic structures on selected chest and abdominal CT images **2.** Recognize appearance of selected abnormal conditions seen during clinical site rotations and during lectures, concentrating especially on radiographs (chest, abdominal, bone) and CT.	• *10 minute oral presentation* • *Appropriate exam/quiz*
Interpersonal and communication skills: *To demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates.*	**1.** Give a 10-minute end-of course presentation of a case seen on service utilizing appropriate references and following all applicable HIPAA privacy regulations.	• *Observations of faculty and staff*

Practice Based learning and Improvement: *Students will demonstrate the ability to assimilate scientific evidence and improve patient care practices.*		• *10 minute oral presentation* • *Critical review of a relevant article*
Professionalism: *To demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates.*	**2.** Exhibit professional behavior and appearance while on service including when interacting with residents, attendings, technologists, patients, and support personnel.	*Observations of faculty and staff*
Systems based practice: 1. *Know how …. fits into the larger system of health care.* 2. *Work with the team and patients to optimize use of system resources*		*Observations of faculty and staff* *Reflection essay* *Group discussion*

III. **Methods of Instruction:**

A. Didactic:

1) There will be two (2) one-hour medical student didactic conferences every Monday – Friday afternoon from 1:00 PM – 3:00 PM. These lectures will be given by Radiology faculty or, occasionally, fellows or residents and will cover radiology topics appropriate for medical students

2) Radiology Grand Rounds occurs the 2nd and 4th Thursday of each month from 3:00 – 4:00 p.m. The lecture on the 4th Thursday is clinical related and attendance is required for the course. Reminder emails will be sent out from the Course Coordinator with more information.

B. Clinical:

1) Students will rotate through a variety of clinical imaging facilities in the mornings Monday through Friday beginning at 8 a.m. and see a variety of subspecialties during the course. Students will spend one week (two weeks for IR rotation) at each selected rotation site at Parkland, Children's, or UT Southwestern.

i. Each elective site can be chosen by the student from the list provided through email communication from the Program Coordinator before the start of each block. Students will receive their elective rotation preferences on a first come, first served basis, among the following choices:

- Breast Imaging
- Body CT

- Body MR
- Emergency Radiology (*4 PM – 8 PM rotation*)
- Interventional Radiology (*Must rotate in IR for 2 weeks, if selected*)
- Musculoskeletal
- Neuroradiology
- Nuclear Medicine
- Pediatric Radiology
- Thoracic Radiology
- Ultrasound
- UT Core (*includes and mix of Chest and Abdominal Imaging)

Students can expect to observe exams being performed by radiologists, residents, and technologists and will learn how the patient experiences each type of exam. The positive and negative aspects of each type of exam will be reviewed.

Students will review imaging studies in the reading room with faculty, fellows, and residents. Students will learn radiologic anatomy, basic exam interpretation strategies, and how the exam findings correlate with the patient's overall clinical picture.

Students must have a **FACULTY** member (**NOT** a resident or fellow) sign an attendance sheet at each morning of visiting a clinical site. These sheets must be uploaded to Moodle each Friday. **Loss of faculty signatures could result in documented absences, which may count toward the maximum allowed absence days.** Due to limited departmental resources and full monthly course enrollments, "make-up dates" for clinical service absences are not permitted.

If there are slower periods during the clinical workday, students may review PACS teaching files provided on their assigned clinical service, study online or printed learning resources described above, or work on their PowerPoint project (described below).

IV. Overview of student responsibilities

A. PowerPoint Presentation Project

1) Students will choose a case seen on clinical service that shows an interesting finding and illustrates a teaching point appropriate for medical students. Students must obtain de-identified, HIPAA–compliant images and present a PowerPoint presentation (approximately 5-7 minutes) on the last two days of the course.

2) Covered sections should include Patient History (chief complaint and any pertinent history – available in Epic), Findings, Differential Diagnosis, Impression, and Discussion. For the Discussion section, students should use any textbooks, online resources, and journal articles necessary to briefly cover the topic.

3) Students may ask the faculty member with whom they read the case for help in obtaining the images for their case presentation. It is recommended that planning ahead of time and setting up an appointment with that faculty member to ensure that he/she has enough time to help you. Sometimes the Head Technologist has been very helpful in getting these images for students as well (see last page of syllabus for further help)

4) **Please note that these images must be de-identified and have no identifiable patient data to ensure no HIPAA violation**. The student case presentations will be saved by the course director for future medical student teaching, so de-identified images are especially important.

5) Extra care should be taken with ultrasound and nuclear medicine images because patient data is "burned" into the image and especially hard to eradicate. Even cropping the image is not always enough if the image can be "un-cropped" later and the patient information revealed.

B. Aquifer Radiology Case Review

1) Each week you will be required to complete a minimum of 1 case from the Aquifer Radiology list, for a total of 4 cases by the end of the course.

2) You will need to self-register via the "sign in" button at the top of the main Aquifer homepage (www.Aquifer.org).

C. Attendance

1) Per UTSW requirements for attendance for MS-4 clinical electives, the student **may not miss more than 4 days of EXCUSED absences**. Due to limits on departmental resources and full monthly course enrollments, "make-up days" will not be permitted. Only four (4) total days of excused absences are permitted for a *Pass* grade, with documentation of an appropriate reason provided to the Program Coordinator.

2) Examples of appropriate reasons for excused absences include residency interviews or illness. Students should contact Clerkship Coordinator or the Education Office (RADEducation@UTSouthwestern.edu) with expected dates of excused absences at least one (2) weeks prior to the start of the course. In the event of illness or an unexpected absence (or missed lecture) arises, promptly contact the Clerkship Coordinator or the Radiology Education Office.

3) Students must attend daily conferences (a sign-in sheet will be posted at the front of the lecture hall). A conference is considered "missed" after the first 10 minutes. Any missed conferences (excluding those from pre-approved/excused absences) are required to be made up by attending the next available Resident Conference(s). Failure to make up missed lectures could result in unexcused absences. There is a limit of two (2) make-ups for missed lectures. Each additional missed lecture thereafter would result in an unexcused absence.

Please note that a Professionalism Form may be filled out when an unexcused absence occurs, and this becomes a part of the student's record in the student deans' office.

D. Dress Attire/Professionalism

1) Professional dress (business casual is acceptable) with white coat and UTSW ID badge is expected, as the student will be rotating on the clinical services and will interact with faculty, residents, other clinicians, technologists, and patients.

2) If the student is assigned to the Interventional Radiology (IR) clinical rotation or expects to participate in procedures at other sites, he/she will need to wear clean scrubs from the scrub cabinet, along with a white coat and UTSW ID badge.

3) Please have cell phones put away during readout.

IV. **Method of evaluation of students and requirements:** Evaluation based on assessment methods listed above, grade is Pass/Fail

A. This course is graded on a "Pass" or "Fail" basis. To receive a "Pass" grade, you must:

1) Meet the attendance requirements assessed by Conference attendance and faculty signatures on the Clinical Site Attendance logs.
2) Present a PowerPoint presentation of a case seen on service at the end of the course.

3) Complete 4 Aquifer Radiology case modules by the last day of the block.
4) Complete evaluations of the faculty and the overall course by Sunday following the last day of the block:
    i. 2 Medhub conferences per day x 1 evaluation per lecturer = 2 Conference evaluations per day
    ii. 1 Medhub evaluation per doctor you shadow during clinical rotation
    iii. 1 Medhub evaluation (overall course evaluation)

    All evaluations must be completed prior to the first lecture on the final day of the block. Students will not receive a Pass grade until all evaluations are completed and all other requirements have been met.

PLEASE LEAVE COMMENTS! We do rely on student feedback to make improvements to the course.

IIV. Additional Help with Retrieving Patient Images

A. Parkland Patient Images:

1) Go to the UTSW Clinical Portal: http://hsir.swmed.edu/default.aspx
2) Log on to UT IntelliSpace PACS (iSite)
3) Select iQuery
4) Type in Patients Parkland MRN
5) Select studies to retrieve
6) Right-click select retrieve
7) Request "Stat"
8) Wait (can take 15 min or more to retrieve)
9) Search for patient under "Patient Look-up"
10) Double Click Image and right click "Save Image to File"

B. Recommended reading:

There are wonderful free online resources designed for medical students learning radiology. Some of the best websites are as follows (adapted from list provided by Alliance for Medical Student Educators in Radiology), but there are many more not listed here:

Chest X-ray.com
http://www.chestx-ray.com
Site devoted to thoracic imaging with many links. Also has a more public section describing all of the modalities and their protocols. One link is designed for medical students. Nice chest CT anatomy section.

University of Virginia Radiology Teaching
http://www.med-ed.virginia.edu/courses/rad/
Excellent radiology tutorial series.

Breast Cancer Detective
http://www.med.umich.edu/lrc/breastcancerdetective
Interactive game teaching basic mammography to medical students from Marilyn Roubidoux at the University of Michigan.

LUMEN Cross-sectional Anatomy Project
http://www.lumen.luc.edu/lumen/meded/grossanatomy/x_sec/mainx_sec.htm
Using CT and the Visible Human Project from Loyola University

Brigham Rad
http://brighamrad.harvard.edu/education.html
Casefiles and "Find the Path" – interactive imaging algorithms for common ER presentations. Several cardiac and nuclear medicine tutorials.

Radiological Anatomy from McGill University
http://sprojects.mmi.mcgill.ca/radiology/joust/index.htm
Basic plain film and cross-sectional anatomy for students

Albert Einstein Radiology Education Site
www.learningradiology.com

Albert Einstein Medical Center Radiology teaching resources and tutorials, cases aimed at medical students and radiology residents-in-training with a very good section for students

Yale Cardiothoracic Imaging
http://www.yale.edu/imaging/contents.html
Comprehensive audio and visual modules covering plain film, CT, MRI, and angiography of the cardiothoracic system. Normal and abnormal. Primarily for residents, but also of interest to students.

Beth Israel Web Tutorials (Gillian Lieberman)
http://www.bidmc.org/MedicalEducation/Departments/Radiology/MedicalStudents.aspx
This is an extensive series of sites, containing modules for students as well as primary care practitioners. It includes flash and ppt modules, some with voice. Excellent and comprehensive site, especially for chest and abdomen. Some files very large.

Dartmouth Anatomy (Nancy McNulty)
http://www.dartmouth.edu/~anatomy
Basic anatomy and radiological anatomy modules, most suitable for first year students or refresher for clinical years.

CT/MRI/cadaver Anatomy from University of Auckland
http://www.fmhs.auckland.ac.nz/sms/anatomy/atlas/intro.aspx
Sectional anatomy with CT and MRI correlation of entire body

Anatomy modules from West Virginia University
http://anatomy.hsc.wvu.edu/eStudyGuide/SecondLevel/Radiologic/P2index.swf
Various radiological anatomy modules, both plain film and cross sectional
SUNY Downstate Brain MRI Anatomy
http://ect.downstate.edu/courseware/neuro_atlas/mri_horizontal.html

OB Ultrasound.net (Joseph Woo)
http://www.ob-ultrasound.net/
Nice introductory site for students interested in learning the rudiments of obstetrical ultrasound.
Beth Israel Nuclear Medicine Tutorial
http://mycourses.med.harvard.edu/vp_view.asp?frame=Y&case_id=%7BA05B20FA-F648-468F-BB4C-F6FE9ED09438%7D
Course designed for primary care physicians covering the indications and descriptions of the common nuclear medicine studies. Nice review for students.

Washington University Nuclear Medicine
http://gamma.wustl.edu/allknown.html
Many assorted examples of nuclear medicine cases. Excellent for review during downtime on service.

Radiology Education
http://www.radiologyeducation.com/
Multiple links to a huge number of websites, lists textbooks and case files.
ACR Appropriateness Criteria
http://www.acr.org/Quality-Safety/Appropriateness-Criteria
A must for every medical student to know about. Useful resource for image algorithm sessions.