Course Name: RAD 2001 – Exploration in Radiology
Department: Radiology
Faculty Course Director: Kristen Bishop, M.D.
Hospital: Clements University Hospital, Zale Lipshy Hospital, Parkland Health and Hospital System, Children's Health
Periods offered: 1-13, July-June
Number of students: 24 maximum
Length: 2 weeks
First Day Contact: Courtney Onic
First Day Time: 7:30 a.m.
First Day Location: Sprague, Ground floor CS0.106

I. Course Description

During your two weeks you will have an opportunity to experience a few different areas in the radiology department and explore radiology as a career path.

II. Course Goals and Objectives:

The student will meet the following goals and objectives at the completion of the course:

A. Patient Care
- *1)* Goal – To provide patient care that is compassionate, appropriate, and effective for the treatment of health problems.
- *2)* Objective –
  - i. Learn how the radiologist combines clinical knowledge and skills with technology to impact the clinical care of the patient.
  - ii. Use the knowledge gained on clinical service to complete reflection questions for each subspecialty site.

B. Medical Knowledge
- *1)* Goal – 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
- *2)* Objective - Recognize the normal anatomic structures on imaging studies and how the appearance is altered due to disease.

C. Professionalism
- *1)* Goal – To demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles
- *2)* Objective – Exhibit professional behavior and appearance while on service including when interacting with residents, attendings, technologists, patients, and support personnel.

D. Interpersonal and Communication Skills
- *1)* Goal - To demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates.
- *2)* Objective –
  - i. Explore the clinical care areas of the radiology department and interact with personnel by interviewing an attending radiologist, resident, radiologic technologist, and patient in each subspecialty area.

III. Methods of Instruction

A. Students will choose 2 subspecialty sites to explore during the rotation. Students will email the faculty contact for each site one week before the start date to learn the appropriate arrival time, location, and contact person. Students will spend one week at each selected rotation site at Parkland, Children's, or UT Southwestern. Students will adhere to the schedule most convenient for the assigned subspecialty division (not vice versa).

1) Prior to the block start date, each student will choose clinical site preferences by completing the Clinical Site Preferences quiz in Moodle. Students will receive their clinical rotation preferences on a first come, first served basis, among the following choices:

1. Breast Imaging
2. Body CT
3. Body MR
4. Emergency Radiology (*meets 4-8 p.m. at Clements*)
5. Musculoskeletal
6. Neuroradiology
7. Nuclear Medicine
8. Pediatric Radiology
9. Thoracic Radiology
10. Ultrasound
11. UT Core (*includes and mix of Chest and Abdominal Imaging at Clements*)

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. The Course Coordinator will collect these clinical attendance sheets on Friday's. **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 required interviews (described below).

B. 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 Clerkship Coordinator with more information.

IV. Course Requirements

A. Interviews

Students will interview a faculty member, resident, and technologist at each clinical site (1 each per week) and complete required interview questions.

B. Aquifer Radiology Case Review

Each day you will be required to complete a minimum of 1 case each day from the Aquifer Radiology list, for a total of 10 cases by the end of the course.

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

C. Diagnostic Radiology student case presentations

Students rotating with Diagnostic Radiology (RAD 1501/2101) give end of course case presentations at 2 p.m. the last Thursday and Friday of each block except 5 and 6. Attendance to these presentations is

required. You are welcome to attend the radiology didactic conferences Monday – Friday 1-3pm though not required.

D. Attendance

Per UTSW requirements for attendance for clinical electives, the student **may not miss more than 2 days of excused absences (80% attendance)**. Due to limits on departmental resources and full monthly course enrollments, "make-up days" will not be permitted. Only two (2) total days of excused absences are permitted for a *Pass* grade, with documentation of an appropriate reason provided to the Education Coordinator.

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 (1) week 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.

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.

E. Dress Attire/Professionalism

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.

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.

Please have cell phones put away during readout and while interacting with faculty.

V. Method of Evaluation of the Student

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 faculty signatures on the Clinical Site Attendance logs.
2) Complete 10 Aquifer Radiology case modules by 5p.m. on the last day of the course
3) Submit completed interviews and reflection questions by 5 p.m. on the last day of the course
4) Complete EQIP Questionnaire and MedHub evaluations of the faculty and the overall course by Sunday following the last day of the block:
   i. One Medhub evaluation per radiologist you shadow during clinical rotation
   ii. One Medhub 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.

VI. 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.

Cleveland Clinic Pediatric Radiology
https://www.cchs.net/onlinelearning/cometvs10/pedrad/default.htm