STUDENT WOMEN’S IMAGING ELECTIVE IN RADIOLOGY

ELECTIVE DIRECTOR

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Not here on Fridays

ELECTIVE CO’ORDINATOR

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INTRODUCTION

Welcome to radiology. This document is intended to provide you with some guidelines regarding your elective goals and objectives as well as some resources for study.

SCHEDULE

A preliminary schedule of your clinical rotations will be made prior to your elective and will be made available on googledocs™ with that link E-mailed to you. We will adjust that schedule according to your career interests, but half your time will be spent in mammography, and half in ultrasound. As we frequently have multiple learners in radiology, please consult with Dr. Lewis before changing your schedule. The clinical areas in radiology are:

Body imaging (CT/MRI)
Reading room (CXR, KUBs, bone and pedi films)
Ultrasound
Neuroimaging
Fluoroscopy (GIs, VCUGs, arthrograms, IVPs etc)
Mammography
Nuclear medicine
Interventional radiology

CONFERENCES

You should attend the noon conference for residents in the radiology conference room (RCR), as well as the 4:30p, Tuesday interesting case conference.

On the first Thursday of each month there is a breast Rad-Path conference in 4th floor Borwell that you should attend.
Other conferences that you are welcome to attend (bold are conferences of particular interest to WI students):

**Monday:**
- 7am Vascular conf (IR, vascular surgery) Aud A
- 4.30p Neuro interesting case (RCR)

**Tuesday:**
- 7a Rheumatology (RR)
- 3p ICN-rad conference (pedi RR)

**Thurs:**
- 7a GU conference (radiology, urology) (RCR)
- **7a Breast-path conference (radiology, pathology) *FIRST THURS MONTH ONLY**
- 8a Pulmonary conference (pulmonary, radiology). *FIRST THURS MONTH ONLY
- 3p ICN-rad conference (pedi RR)
- 5p Bone (residents, student room)

**Friday:**
- 7a GI conference (radiology, GI) Aud F
- 11a Neuro mega rounds (radiology, neurology, neurosurgery) Aud E

There are also a number of tumor boards that may interest some students and residents. These are listed below.

Check schedule and staff for attendance

**Monday:**
- 7a GI tumor board

**Tuesday:**
- 8a Pulmonary tumor board (CTOP) RCA
- 4p Neuro oncol tumor board
- 4.30p Lymphoma tumor board

**Thursday:**
- 4:30p GU tumor board

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**CODE OF CONDUCT IN RADIOLOGY**

1. You are expected to be in the assigned clinical area between 8-5p unless you have to be at a required learning activity by your department, post-call or covering clinic. If there is a conflicting required activity, this should be discussed with Dr. Lewis prior to beginning of the elective.

2. Please dress appropriately, as you would in a clinical area. In fluoroscopy and IR, as well as during procedures in CT, US and mammography, scrubs/white coats may be required.

3. The workstations are our offices and consulting rooms. Talking loudly, discussing personal matters, answering a cell phone and similar behaviors are unprofessional and distracting while we are reading studies. Any behavior that would be inappropriate during a clinical interaction is inappropriate in our reading rooms.

4. The PACS workstations are not to be used for email or activities unrelated to work. They can be used for accessing teaching resources but be prepared to make the workstation available if required by a member of radiology staff or resident. I would suggest that you bring your own laptop.

5. The presence of learners requires considerable time and effort by both radiology staff and residents. There are times when the number of learners or the workflow may require that staff ask you to utilize self-learning resources. Please be sensitive to this.
**ASSESSMENT AND EVALUATION**

You will be given a web-based quiz at the end of your elective. This will cover ultrasound and mammography. You will be sent an email on how to register for this exam. E-value will be completed on all elective students. Input is requested from all staff and residents. You will be given an E-value to complete of your elective.

**GENERAL LEARNING OBJECTIVES**

These will obviously depend on your career interests, but global learning objectives for this elective are for you to:

1. Develop basic image interpretation skills in mammography, gynecological and obstetrical ultrasound.
2. Learn appropriate imaging algorithms for common diagnostic situations, with an emphasis on those in your area of interest
3. Learn where image guided invasive procedures are beneficial
4. Understand some of the risks and benefits of imaging – particularly the risks associated with radiation exposure and awareness of the potential impact of unnecessary or repeat CT imaging in patients. This includes: understanding the concept of high risk groups (children and young patients especially females, pregnant patients) for radiation exposure especially from CT scans and how to minimize the risk
5. Understand how to provide the appropriate clinical information to radiology so that the correct study, with the optimal protocol can be performed and the best interpretations be made of the data.

**GENERAL EDUCATIONAL RESOURCES**

The self teaching room is available all week outside of M,T,W 9-12p. The code for the door is: 135.

The computers in there have a login of radstudent/radstudent

**TEXTBOOKS**

We will lend you two textbook: Herrings: Learning Radiology and Felsons: CXR Workbook. They must be returned at the end of the elective in the condition they were lent.

**CDROMS**

Wendi has a set of teaching CDROMS including ones in OBGYN and general radiology, MSK, chest imaging and radiological anatomy that you can checkout.
PACS TEACHING FILMS

You can access the student teaching files on the PACS workstations by using your username and password which should be given to you on the first day. If you have not been given one, contact Wendi Jewell. The instructions for logging in, configuring the PACS system and accessing these files is on a separate sheet that should have been in your packet. The Student.GU folder contains the women’s imaging files for US, and the Breast.(title) folders the breast imaging files.

There are also various other folders here such as neuro, body MRI, cardiac etc which you are welcome to look at if you wish.

CORE CASES

If you are a DMS student you will already have done some of the CORE cases. We highly recommend that you review these cases, which can take the place of textbook study for this course. These cases can all be accessed at http://www.med-u.org/. These are a series of interactive cases that are designed to teach the student curriculum in radiology. These include cases in chest, GI, GU, neuro, pediatrics and MSK as well as women’s imaging. They include multiple web-links to expand the learning experience. Your prior login or that from CLIPP or FMcases is valid.

OTHER GENERAL RADIOLOGY WEB RESOURCES

www.learningradiology.com (note, use the ppt links, some of the flash links go to adverts for his book)
University Virginia radiology tutorials
BrighamRad teaching cases
Beth Israel (Lieberman) web-tutorials (see list at bottom page)
Harvard guide to imaging in pregnant patients
Dartmouth Anatomy web-course
Yale cardiothoracic imaging module
ACR appropriateness criteria
AMSER National Curriculum in Radiology for Medical Students

WEB SOURCES OF RADIOLOGICAL IMAGES

http://images.google.com/
http://www.yottalook.com/
http://goldminer.arrs.org/
MODALITY SPECIFIC GOALS, OBJECTIVES AND EDUCATIONAL RESOURCES

These goals, objectives and educational resources are specific for the individual areas and will depend on your career interests.

**Mammography**

**Ultrasound**

**MAMMOGRAPHY**

Mammography has 2 physical areas: screening mammography is in 3L in the New Doctors Building. Diagnostic mammography and biopsies occur in 3S in the main radiology department.

Biopsies and other procedures are performed M,Tu,W,Th mornings. Diagnostic exams occur on the other sessions in 3S.

Screening mammograms are read by staff on M-F mornings in 3L. Residents often read in the afternoons there. You should ask staff before you join them for a screening session.

**Goals of rotation**

- See how mammograms and breast ultrasound are performed
- Be able to briefly describe mammographic procedures to patients
- See how we use different mammographic views and ultrasound for problem solving in diagnostic mammography
- Understand the differences between screening and diagnostic mammography
- Know the effect of screening mammography on survival rates. Know the current recommendations for screening mammography and MRI
- Understand the management of screening 'call back' patients
- Understand the meaning of BIRADS 0-6 categories
- Know the indications for referral for diagnostic mammography and how to indicate the abnormality appropriately.
- Know the current indications for breast MRI.
- Understand some of the limitations of breast imaging techniques including the effect of breast density.
- See how ultrasound is used in the diagnostic setting and some of its limitations
- Know what the options are for image guided procedures in the breast.
- Understand how clinical examination and imaging are inter-related and how they affect management especially of palpable breast masses.
- Understand what a radiologist is looking for on a mammogram and what those terms mean:
- Calcifications, Asymmetric densities, Architectural distortion, Masses.

- See some examples of benign and malignant processes in the breast on mammography and ultrasound

### Specific recommendations

- See at least two full mammographic series (CC, MLO) being obtained by a technologist
- Follow at least three patients through her diagnostic evaluation including additional mammo views and ultrasound, watching the tech performing the views as well the radiologist interpreting them.
- Perform a clinical breast examination on consenting women with palpable masses prior to the ultrasound
- Look up the BIRADS categories
- Go through CORE Women's Imaging Case 2 again
- Review Dr. Poplacks lecture and/or this lecture from U.Washington on screening or this one on diagnostic mammography/breast MRI
- Watch image guided breast procedures performed, assist in basic patient care procedures where possible, depending on the case and staff involved and if a resident is present, you may get to assist in procedures.
- Sit in on breast MR interpretation sessions.

### Additional reading

- [ACR 2010 guidelines for screening breast imaging](#)
- [Breast Cancer Detective](#)
- [Beth Israel (Lieberman) breast imaging module](#)

### ULTRASOUND

Ultrasound occurs in two locations: on 5L there is infertility ultrasound and some basic gynecology/early OB ultrasound. This occurs all mornings, and some afternoons. Dr. Porter is often staffing upstairs.

The remaining gynecological and obstetrical ultrasound (as well as the other non-WI ultrasound) occurs in 3S in the main radiology department.

There is a high risk OB staff member in the department most mornings.

### Goals of rotation

- Gain hands-on practice in using ultrasound imaging:
- Be able to find and recognize major intra-abdominal and intrapelvic organs
- Gain basic familiarity with how moving the transducer changes the imaging plane
- See how altering scanning parameters such as gain, depth and focal zone affect our images
• See how different transducers are used for different purposes
• Learn the basic ultrasound imaging characteristics of tissues –
  o simple fluid, complex fluid, soft tissue, bone, air, fat
• See how the different types of Doppler ultrasound (m mode, pulsed, color and power) image motion
• Learn the appropriate indications for the common ultrasound examinations
• See some of the limitations of ultrasound –
  o obesity, bowel gas etc
• Learn the classical appearances of common conditions:
  o Pelvic: Fibroids, endometrial thickening, ovarian cysts, uterine position, free fluid, polyps
  o Pregnancy: early pregnancy, normal and abnormal, ectopic, normal 2nd and 3rd trimester pregnancy, fetal position and lie.
• Know the appearance and timing of normal early embryonic development on ultrasound (gestational sac, yolk sac, embryo, heart beat)
• See some common fetal malformations
• Understand the technique of obtaining, accuracy and significance of fetal measurements – growth, fluid, Doppler
• Understand how bHCG measurements are incorporated into the interpretation of early OB ultrasounds.

Specific recommendations

• Students should spend at least 50% of time with technologists watching scans. Please introduce yourself to all techs at the start of the elective.
• Requests are put into the plexiglass boxes in the corridor as patients arrive. Keep an eye on these to identify cases that you wish to be involved with.
• When a high risk OB staff member is present, the student should generally work with them and their patients. Please introduce yourself at the start of the elective.
• Spend several sessions on 5L (mornings usually) watching studies there. Please introduce yourself to Dr. Porter at the start of the elective.
• Scan patients themselves (not transvaginally), with patient permission after tech leaves room. Please be very sensitive to time constraints in this very busy area and do not interfere with workflow patterns without checking with a technologist.
• Remainder of time with attending/residents in reading room, helping with clinical workflow where possible.
• After they see an abnormal study: look up brief background on condition/additional images (e.g. http://www.mypacs.net (search under ultrasound), www.ultrasoundcases.info or the Brigham teaching database.
• Go through CORE Women's Imaging Case 1 again

Additional reading