Resident Core Curriculum

Breast Imaging

General Goals: The specific goals include objectives required for every level of training with graduate levels of supervision and responsibility. During every training rotation, the resident will read the required literature and study the teaching file in breast imaging. Over time, the resident will be progressively more knowledgeable about normal radiographic anatomy and the radiological appearances of abnormal mammograms. Residents will be competent at interpreting mammograms and other breast imaging examinations, making further recommendations, and performing breast image guided procedures at the completion of the final rotation. In addition, the resident will increasingly understand disease entities, their clinical presentations, and current modes of treatment.

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

1. Residents must be able to perceive breast masses, calcifications, and other abnormalities on mammography and be able to determine their probability of malignancy.
2. Residents must determine the appropriate management of mammographic abnormalities.
3. Residents will learn to describe the technique for obtaining the images, the correct terminology, and the appropriate uses for both standard and problem-solving views
4. Residents will perform targeted breast clinical examinations and correlate with diagnostic mammography and ultrasound.
5. Residents will perform and interpret breast ultrasound examinations.
6. Residents will understand methods of performing breast MRI and principles of interpretation.
7. Residents will perform and understand the indications and complications of breast interventional procedures including: needle localization with mammographic or ultrasound guidance, cyst aspiration, fine needle and core needle biopsy with stereotactic, ultrasound or MRI guidance, and galactography.
8. Residents will understand the psychosocial concerns of patients undergoing breast imaging and learn how to deal with these issues in a compassionate and caring manner.
9. Residents will learn basic breast pathology and the clinical significance of various benign and malignant lesions.
10. Residents will determine the elements of quality control and quality assurance programs in mammography, including the criteria necessary for high quality mammography and the common technical problems that impact on image quality. Additionally, residents will understand the elements of digital mammography quality assurance.
11. Residents assigned to breast imaging will be available for consultations by imaging technologists, clinicians, and other health care providers, except during conference times, when the attending faculty will cover.
12. Resident questions will be referred to the supervising faculty covering breast imaging.
13. Resident review of cases with the supervising faculty will be conducted as many times in the day as necessary to keep an efficient workflow.
14. All resident examinations will be reported by the end of every working day.
15. Residents will check and sign his/her reports prior to final verification by supervising faculty.
16. Residents must be familiar with the operation of all imaging equipment.

17. 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.
18. Residents must check examinations before the patient leaves the department if requested to do so by the supervising faculty.
19. 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.
20. Residents will do in-depth reading and study, along with a review of teaching file cases, to become knowledgeable about breast pathology and the clinical significance of various benign and malignant lesions, and gain a general understanding of the disease entities, their clinical presentations, and certain modes of treatment.
21. Residents will serve as a secondary consultant to referring physicians regarding breast 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.
22. Residents will become prepared to pass the certifying examination of the American Board of Radiology.
23. Residents will teach and share knowledge to medical students, radiologic technologist students, and junior residents.
24. Residents will participate in the preparation and presentation of imaging studies at the monthly Interesting Case Conference.
25. Residents will interpret a minimum of 240 mammograms during a six month interval during the last two years of residency.
26. Residents will receive at least 8 hours of instruction in both digital and film-screen mammography.

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 (Second Year Resident):

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
- Patient satisfaction is a primary concern as mammography is an extremely emotional issue for many women.
- Become familiar with the operation of the various breast 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
- 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 abnormal imaging studies

Medical Knowledge:
- Learn how to evaluate clinical and mammographic abnormalities
- Observe technologists performing CC, MLO, spot compression, and magnification views during the first week
- Learn ACR BI-RADS lexicon for mammography and ultrasound
- Perform a targeted clinical breast examination
- Learn breast ultrasound technique

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
- Review assigned teaching file cases

Interpersonal and Communication Skills:
- Patients who are "difficult" or angry are more often than not just very worried that they have breast cancer. Often these patients will be very appreciative after you communicate with them
- Communicate with the patient at all times during the examination to ensure that patient remains comfortable
- Use appropriate terminology when performing a biopsy such as using the terms “biopsy device” and “click” rather than “gun” and “fire”.
- 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 breast 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 breast 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 (Fourth Year Resident):

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 mammography 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 breast imaging 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)

- Perfect diagnostic examination techniques and be very skilled and efficient in performing, reading, and interpreting all mammograms 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)

Medical Knowledge:

- Recommend the appropriate study based on the clinical scenario and understand the relative strengths of each modality
- Familiarity with imaging findings of breast pathology and the clinical significance of various benign and malignant lesions
- Identify pathology in order to interpret routine beast imaging studies with accuracy appropriateness to the level of training when presenting to the attending and demonstrate improvement compared to the prior rotation
- Distinguish between normal and abnormal breast imaging to level of training when presenting to the attending and relate the imaging findings to the clinical condition and its pathology
- Focus on the screening and detection of abnormalities through observing, assisting, and performing breast imaging procedures
- Perfect skills for performing high-quality screening mammography
- Learn principles of breast MRI technique and interpretation
- Learn ACR BI-RADS lexicon for breast MRI
- Interpret DEXA examinations
- Expand procedural abilities through assisting or performing an ultrasound digital needle localization, stereotactic core needle biopsy, and MRI guided procedures
- Divide time between screening and diagnostic interpretation
- Refine techniques for reading screening mammograms
- Develop management skills, including staging of the axilla with ultrasound and interpreting staging breast MRI
- Understand the clinical management of the conditions encountered
- Development of appropriate differential diagnostic lists will be well advanced
- Act as a consultant in breast imaging to the clinical services

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 assigned teaching file cases

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 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 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:

- 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 ACR practice guidelines and technical standards for beast imaging
- Demonstrate knowledge of ACR appropriateness criteria and cost-effective imaging evaluation of breast pathologies
- Familiarity with departmental procedures for safety requirements 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.

Reading List for Each Year

Second Year

1. Daniel B Kopans. *Breast Imaging*. Lippincott Williams & Wilkins, 3rd Edition, 2007.

2. Lawrence W. Bassett, Valerie Jackson, Karin Fu, and Yao Fu. *Diagnosis of Diseases of the Breast*. Saunders, 2nd Edition, 2010.

Fourth Year

3. Thomas Stavros. *Breast Ultrasound*. Lippincott Williams & Wilkins, 1st Edition, 2003.

4. Gilda Cardenosa. *Breast Imaging Companion*. Lippincott Williams & Wilkins, 3rd Edition, 2007.

5. Elizabeth Morris and Laura Lieberman. *Breast MRI-Diagnosis and Intervention*. Springer, 1st Edition, 2007.

Other Requirements/Expectations

Conferences

Attend and appropriately prepare for the following conferences:

Breast Multi-disciplinary Conference- Every Friday, 1:30 p.m., Cancer Center (6th floor Hospital West)
Breast Imaging Resident Lectures (required)
Every Wednesday, from 8-9 a.m., we have a meeting. These are rotated between the following, and will be posted on the biweekly schedule.

- Biopsy Conference (required)- Every other Wednesday, 8:00 a.m., BCC Reading Room.
- Mammography QA Conference (required)- Every 5-6 weeks.
- Mammography Journal Club (required)- About 8 per year, BCC lounge. You will be assigned an article present.
- Breast MRI/MRI biopsy conference (required)
- Mammography Staff Meetings (attendance not required)- Every 5-6 weeks

Daily Work

The **first month rotation** will be spent seeing diagnostic patients at BCC. During this time, you will see a high number of cancers and learn how to evaluate clinical and mammographic abnormalities. The **second month** will be focused on screening and detection of abnormalities. You will also have the opportunity to observe and perform breast procedures during the second month. The **third month** will emphasize management skills. Residents on the third month will typically split time between screening and diagnostic during the month.

Patient satisfaction is a primary concern. Mammography is an extremely emotional issue for many women. Some women are convinced that they have breast cancer before we even start. Patients who are "difficult" or angry are more often than not just very worried that they have breast cancer. These patients will be very appreciative after you talk to them.

If you are male, use common sense about patient contact. If the patient is in a gown, have a chaperone. This is for your protection as well as the patient.

Women with symptoms: All women with lumps or other symptoms should have a breast examination by a physician. Ask the woman to show you the area that she is concerned about. If she has difficulty finding it, ask if she would like to sit up. Once she finds the area, examine the area of concern as well as the remainder of that breast. (Please avoid using the term "I am going to feel your breast." Use "I am going to examine your breast/this area now" instead). Some women will have a tremendous amount of anxiety about their lump or mammogram. Talking with these patients is very reassuring.

Biopsy etiquette: Please use the terms "biopsy device" and "click" rather than "gun" and "fire".

Mammogram reports: We use Magview reporting for mammograms, breast US, MRI, and procedures. No studies should be left because the patient is returning for additional views or because we are waiting for old films. Abnormal mammogram results are to be handled in the following manner:

BIRADS 4/5: All patients requiring biopsy should be given the results directly (after review with an attending). Have the patient dress and wait in the gowned area. Give the paperwork to the nurse or technologist who will discuss the procedure with the patient, find out about medication usage, call the referring MD and give the patient an appointment. She will document that we have discussed the findings and recommendations with the referring physician and patient. This is included in the report.

BIRADS 0: 5-10% of women undergoing screening will be called back for additional views or ultrasound. Please check the TR box on the log sheet. The techs will call the patient. The study is given a BIRADS category "0: Needs additional imaging".

Preliminary: If outside films are needed, the case is also a BI-RADS 0

Breast Care Center:

The resident should be on duty from 8:00 a.m. until the work is completed. Attendance at noon conference is strongly recommended. Notify the attending before leaving for conference and before leaving for the day.

Diagnostic Rotation (first month): You will spend most of the day in the Diagnostic reading room. The techs will put the jacket of diagnostic studies in the first film slot and write a note on the white board. This helps us keep track of who is waiting and for what. Hang the films and review. Please write the status of the patient on the white board ("needs left spots" or "DONE"). Whoever erases the patient's name lets the patient leave!

Screening and Procedures Rotation (second month): Screenings from Orange, Northridge, our mobile van, the Fluvanna Correctional Center for Women, and several other outside facilities are hung in the screening reading room. Digital mammograms should be reviewed on the monitor.

Management Rotation (third month): Your time will be split between screening/procedures and diagnostics.

DEXA

We perform DEXA scans at Northridge, and interpret DEXAs from our referring physicians from both NR and the hospital. These should be interpreted with the attending at BCC.

Teaching File

We have collected an extensive teaching file of breast imaging cases. You are welcome and encouraged to use them during your rotation. You should try to review at least 15 cases per week during your rotation. The cases are electronic in MS Word format on the I drive under Harvey shared folder- TF cases. Editing of cases is password protected. Just click "read only" to access the case when you open it. To view an image with better detail, CONTROL-click on the image which will open in an imaging software program (Photoshop or other). Close these windows when done with the case.

The format is such that the screening views are presented first and you must decide upon the findings, BI-RADS assessment category, and recommendation. Page down along the document to compare your answer with ours. Then the diagnostic views (if appropriate) will be shown and you should again decide upon the findings, assessment, and recommendation.

Vacation/Meeting Time

Vacation is first come/first served, but we will be as flexible as possible. Total allowable vacation/meeting time during all of your months of mammography is 2 weeks, per department policy. This will maximize your experience and prepare you for practice as well as written and oral boards.

We hope your rotation on the mammography service is productive and enjoyable. We are always striving to improve the rotation. Please let us know if you have an idea for improvement.

Updated 6/25/2009; Revised 2/2010, Revised 4/2011