

OUTLINE OF MAMMOGRAPHY ROTATION GOALS

Section chief: Haydee Ojeda-Fournier, MD

Staff: Drs. Jade de Guzman (JG) and Julie Bykowski (JB)

Fellows 2012-13: None

Clinic manager: Amy Chatten phone- 858-822-6120

Lead TA: Jerrecca Bergman phone- 858-822-6126

Head technologists: Ms. Fabiola Perez RT (Moore's) and Ms. Louise Miller RT (Lewis St)

Our techs: Barbara Jo (MR biopsy and needle loc), Hillary (stereo and needle loc), Fabiola (MR biopsy and needle loc), Jennifer Nelson and Jennifer Cline. Per Diem: Annita, Karen.

Lewis street techs: Louise Miller, Jennifer Cline and Sharon.

Section administrative assistant: Lori Bunch- lbunch@ucsd.edu

Welcome to breast imaging: We are located in the first floor of the Moore's Cancer Center- imaging services. To respect the privacy of our patients, please use the back hallway whenever possible.

Phone number: Front desk- 858-822-6121 Reading room- 858-822-6156 or 26157; MR reading room- 858-822-6130

Work hours: Residents are expected from 8 am to 5 pm Monday to Friday, except Tuesday morning- please report to service as soon as Grand Rounds are over. Please report any absence to Lori Bunch as well as your chief resident, and Kathy Shepperd.

Breast Conference: Mondays 7:45 to 9:00am- **breakfast is served.** Please make sure that conference list has been added to the "Breast Conference Work List" on PACS every week, no later than Friday morning. Include recent mammogram, US and breast MR. Document pathology results and pertinent imaging findings (including side and o'clock/quadrant location) in the printed conference list. ***This is a great learning opportunity.***

US Phantom: Please arrange with Drs. Blickenstaff or Ojeda to perform a turkey breast phantom during the first week of rotation. You will need to bring a defrosted small turkey breast and pimento stuffed olives. You will need to successfully complete this exercise before being allowed to perform the procedure on a patient.

Resident education folder: You will find a resident education folder in each desktop in the reading room. All required journal article readings, BI-RADS descriptors, and core lectures are available in this folder. A BI-RADS binder lexicon binder is in the reading room for your reference, please use the appropriate lexicon!

Overall Competencies:

(A) Patient Care

Definition: Provide safe, efficient, appropriately utilized, quality-controlled care in breast imaging.

Practice performance measurements: Breast imaging section evaluation (to include pertinent safety issues such as proper methods to obtain informed consent).

(B) Medical Knowledge

Definition: Provide appropriate diagnostic and/or interventional breast imaging techniques to meet the imaging needs of patients, referring physicians, and the health care system.

Practice performance measurements: Breast imaging section evaluation; yearly objective test (ACR Diagnostic Radiology In-Training Examination, mock oral boards, ACR Mammography Case Review test, etc).

(C) Practice-Based Learning and Improvement

Definition: Participation in evaluation of one's personal practice in order to optimize patient care through lifelong learning.

Practice performance measurements: Breast imaging section evaluation (to include knowledge of BI-RADS audit procedures).

(D) Interpersonal and Communication Skills

Definition: Communicate effectively with patients, colleagues, referring physicians, and other members of the health care team concerning breast imaging appropriateness, informed consent, safety issues and results of imaging tests and procedures.

Practice performance measurements: Breast imaging section evaluation (to include communication issues such as discussing abnormal breast imaging results with patients and referring physicians).

(E) Professionalism

Definition: Commit to high standards of professional conduct demonstrating altruism, compassion, honesty and integrity.

Practice performance measurements: Breast imaging section evaluation (to include compliance with breast imaging section policies such as those concerning MQSA regulations).

(F) System-Based Practice

Definition: Understand the factors that optimize coordination of care within a local health care system as well as the global health care system in general by understanding appropriate utilization of imaging resources.

Practice performance measurements: Breast imaging section evaluation (to include participation in multidisciplinary breast care conferences).

General rotation goals:

By means of lectures, conferences, textbooks, syllabi, journal reprints, videotapes, teaching files, and other teaching materials, the resident should become familiar with and understand the following topics in breast disease:

Breast anatomy, physiology, and pathology (B)

- Breast development
- Normal breast anatomy and histology; alteration with age, pregnancy, menstrual cycle, and hormonal effects; male breast anatomy
- Pathologic appearance and clinical significance of:
 - Benign breast lesions
 - Atypical ductal hyperplasia (ADH), atypical lobular hyperplasia (ALH), lobular carcinoma in situ (LCIS), and other histologic risk factors
 - Ductal carcinoma in situ (DCIS), including its histologic subtypes
 - Invasive ductal carcinoma not otherwise specified (NOS); subtypes of invasive ductal carcinoma (mucinous, medullary, papillary, tubular); invasive lobular carcinoma
 - Other types of breast cancer, such as Paget's disease and inflammatory carcinoma
 - Other malignancies involving the breast, including phyllodes tumor, lymphoma, leukemia, sarcomas, and metastases
- Histologic grading
- Pathologic staging
- Multifocal and multicentric carcinoma
- Margin analysis for specimens containing malignancy

Epidemiology (B)

- Risk factors for breast cancer
- Indications for genetic screening
- Breast cancer incidence and mortality, including longitudinal trends
- Breast cancer staging and survival rates by stage

Mammographic equipment and technique (A, B, C)

- Both screen-film and full-field digital mammograph
 - Features of dedicated mammographic units, including target, filtration, automatic exposure control (AEC), and grids
 - Factors affecting optical density, contrast, sharpness, and noise
 - Selection of technique factors, including effects of milliamp-seconds (mAs), kilovolt peak (kVp), target and filter material choice, and density settings on image quality and radiation dose
 - Effect of breast thickness and composition on technique, image quality, and radiation dose
 - Mammographic positioning for CC and MLO views
 - Mammographic positioning for women with breast implants
 - Rationale for breast compression
 - Clinical image assessment for proper breast positioning, compression, exposure, contrast, sharpness, and noise
- Screen-film mammography

- Characteristics of mammographic screen-film systems
- Film processing
- Effect of screen-film speed, optical density, and film processing on radiation dose
- High-intensity view boxes, view box masking
- Full-field digital mammography
 - Characteristics of full-field digital mammographic systems, including advantages and limitations
 - Effects of post-processing on the digital mammographic image
 - Effect of signal-to-noise ratio on radiation dose
 - Dedicated high-luminance, high-resolution viewing monitors
 - ACR Practice Guideline for the Performance of Whole Breast Digital Mammography (3)

Mammography quality assurance (F, C, A, B)

- Familiarity with content in the ACR Mammography Quality Control Manual (4)
- Purpose and frequency of performance of quality control tests performed by the technologist and physicist
- Demonstrate proficiency in recognizing the mammographic appearance of artifacts for both screen-film and digital mammography
- Regulation
 - Equipment, quality control, and personnel (radiologist, technologist, physicist) requirements for ACR accreditation and MQSA certification
 - Responsibilities of the lead interpreting physician
- Medical audit
 - Audit definitions as provided by BI-RADS
 - Desirable goals and benchmarks for standard outcome parameters, for both screening and diagnostic mammography (5-7)
 - Auditing requirements for MQSA certification

Mammographic interpretation (A, B, C, D, E)

- Optimal viewing conditions, including a low ambient light environment
- Demonstrate proficiency in:
 - Recognizing normal mammographic anatomy
 - Recognizing the mammographic features of characteristically benign and suspicious breast calcifications
 - Recognizing the mammographic features of characteristically benign and suspicious breast masses
 - Recognizing the mammographic appearance of indirect signs of malignancy (architectural distortion, asymmetries, etc)
 - Recognizing the mammographic features of the surgically altered breast, including implants
 - Recognizing the mammographic features of probably benign (BI-RADS category 3) lesions
- Principles, methods, strengths, and pitfalls of computer-aided detection (CAD) and double reading

Screening mammography (A, B, C, D, E)

- Randomized clinical trials, case-control studies, service-screening studies: purpose, methods, results
- Pitfalls in evaluating screening results: lead-time bias, length-bias sampling, selection

- bias, prevalence versus incidence screening, interval cancer rate, survival rates
- Relative screening efficacy of clinical breast examination, breast self-examination, and mammography
- Benefit-risk assessment, including radiation risk and false positives
- Cost-effectiveness
- Controversies regarding screening women aged 40-49 years; younger than age 40
 - Screening guidelines of ACR, American Cancer Society, National Cancer Institute, US Preventative Services Task Force, etc.
- Logistics and throughput issues in the performance and interpretation of screening mammography examinations
- ACR Practice Guideline for the Performance of Screening Mammography (3)

Diagnostic (problem-solving) mammography (A, B, C, D, E)

- Techniques and indications for and value of supplementary mammographic views
- Demonstrate proficiency in:
 - Performing the work-up of lesions seen on only one standard (MLO or CC) screening view
 - Three-dimensional lesion localization
 - Correlation of palpable with imaging findings
 - Evaluation and management of a palpable mass (or other focal symptoms) when there are no associated mammographic findings
 - Assessment of extent of disease for suspicious and for known-malignant lesions
- ACR Practice Guideline for the Performance of Diagnostic Mammography (3)

Breast ultrasound (A, B, C, D, E)

- Equipment and physical principles
- Techniques
- Indications
- Demonstrate proficiency in:
 - Scanning the breast
 - Recognizing normal sonographic anatomy
 - Recognizing features of simple cysts, complicated cysts, complex masses
 - Recognizing differential features of benign and malignant solid masses
 - Correlation with findings at mammography and clinical breast examination
- Limitations in the detection and assessment of microcalcifications
- Controversies regarding the role of screening whole-breast ultrasound examination
- ACR Practice Guideline for the Performance of a Breast Ultrasound Examination (3)
- ACR Breast Ultrasound Accreditation Program

Breast MRI (A, B, C, D, E)

- Equipment and physical principles
- Techniques
- Indications
- Strengths and limitations of kinetic and morphologic analysis
- Demonstrate proficiency in:
 - Recognizing normal MRI anatomy
 - Recognizing differential features of benign and malignant masses
 - Recognizing differential features of benign and malignant non-mass-like enhancement

- Evaluating implant integrity
- Correlation with findings at mammography, ultrasound, and clinical breast examination
- Limitations in the detection and assessment of lesions presenting as microcalcifications
- Controversies regarding the role of screening breast MRI examination
- ACR Practice Guideline for the Performance of MRI of the Breast (3)

Reporting and medicolegal aspects of breast imaging (C, D, E, F)

- Demonstrate proficiency in producing breast imaging reports, including:
 - ACR BI-RADS lexicon terms for mammography, ultrasound, and MRI
 - Lesion location
 - Categorization of breast composition (BI-RADS breast density descriptors)
 - Final assessment categories (ACR BI-RADS; MQSA regulatory requirements)
 - Management recommendations
 - Concordance between lesion descriptors and assessment categories
 - Concordance between assessment categories and management recommendations
- MQSA regulatory requirements for reporting mammography results to referring clinician and patient
- Medicolegal aspects of all breast imaging and interventional procedures
 - Understanding the supervisory responsibility for approving the technical quality of a given examination
 - Communication issues and follow-up of abnormal findings
 - Informed consent for invasive procedures

Interventional procedures (A, B, C, D E)

- Principles, indications and contraindications, equipment, preparation, technique, advantages, disadvantages, accuracy, and auditing for:
 - Needle-wire localization guided by mammography and ultrasound
 - Ultrasound-guided core biopsy (also fine-needle aspiration [FNA], if available)
 - Stereotactically guided core biopsy (also fine-needle aspiration [FNA], if available)
 - Ultrasound-guided cyst aspiration
 - Targeted ultrasound to substitute ultrasound guidance for MRI guidance
 - MRI-guided core biopsy and needle-wire localization
 - Use and limitations of using markers to indicate the site of percutaneous biopsy
 - Specimen radiography, including paraffin block radiography
 - Galactography
- Assessment of imaging-pathologic concordance
- Post-procedure follow-up imaging
- ACR Guideline for the Performance of Ultrasound-Guided Breast Interventional Procedures (3)
- ACR Guideline for the Performance of Stereotactically Guided Breast Interventional Procedures (3)
- ACR Ultrasound-Guided Breast Biopsy Accreditation Module (part of the ACR Breast Ultrasound Accreditation Program)
- ACR Stereotactic Breast Biopsy Accreditation Program

Therapeutic and management considerations (F, A, B, C)

- Basic understanding of breast cancer treatment options

- Role of breast imaging in planning and monitoring of breast cancer treatment and post-treatment follow-up
- ACR Practice Guideline for the Management of Ductal Carcinoma In-Situ of the Breast (DCIS) (3)
- ACR Practice Guideline for Breast Conservation Therapy in the Management of Invasive Breast Carcinoma (3)
- ACR Appropriateness Criteria for: Breast Microcalcifications; Nonpalpable Breast Masses; Palpable Breast Masses; Stage I Breast Carcinoma (8)

Economics of breast imaging practice (F, E, C)

- Basic understanding of coding and billing
- Revenue positive, revenue neutral, and revenue negative breast imaging examinations
- Strategies to improve the profitability of a breast imaging practice

Other recommendations (A, B, C)

- Minimum of 12 full-time equivalent weeks of clinical training in breast imaging during 4-year residency; it is recommended that the initial month of breast imaging training be given in the first or second year of residency, to expose residents to the practice of breast imaging before they are expected to make a subspecialty career choice
- Active participation in screening and diagnostic mammography interpretation
- Hands-on performance of breast ultrasound examinations
- Hands-on performance of all interventional breast imaging procedures, but especially needle-wire localization and ultrasound-guided core biopsy
- Active participation in breast MRI interpretation
- Formal teaching conferences (lectures, case presentations)
- Imaging-pathologic correlation conferences; also multidisciplinary breast cancer case conferences, if practical
- Direct observation or videotape of mammographic positioning for routine and supplementary views
- Review of teaching file materials (film or digital images), especially using computer-based interactive formats
- Breast imaging textbooks available in department and/or breast imaging section library
- Reprint file or reference library including breast imaging materials
- Log of numbers of mammograms and sonograms interpreted and of procedures performed by each resident

UCSD Radiology Resident Breast Imaging 1st Rotation

Goals and Objectives

<p>Patient Care</p> <p>Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.</p>	<ul style="list-style-type: none"> • Know the ACS Guidelines for screening mammography in asymptomatic women. • Know recommendations for imaging young female patients (under the age of 30). • Be able to describe masses and calcifications according to ACR Reporting System (BI-RADS). • Recognize the common mammographic features of benign and malignant pathology • Be able to perform needle localizations on your own. • Obtain follow-up on all breast procedures that you perform and keep track of them for your resident procedure record. • Learn to do stereotactic biopsies. • Practice US guided core biopsy procedure on turkey breast, then participate in US guided cores at Cancer Center.
<p>Medical Knowledge</p> <p>Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and socialbehavioral sciences, as well as the application of this knowledge to patient care.</p>	<ul style="list-style-type: none"> • Understand the MagView Mammo Reporting Module. • Know the ACS Guidelines for screening mammography in asymptomatic women. • Know recommendations for imaging young female patients (under the age of 30). • Be able to describe masses and calcifications according to ACR Reporting System (BI-RADS). • Recognize the common mammographic features of benign and malignant pathology • Be able to perform needle localizations on your own. • Obtain follow-up on all breast procedures that you perform and keep track of them for your resident procedure record. • Learn to do stereotactic biopsies. • Practice US guided core biopsy procedure on turkey breast, then participate in US guided cores at Cancer Center.
<p>Practice-based Learning and Improvement</p>	<ul style="list-style-type: none"> • Understand the MagView Mammo Reporting Module. • Know the ACS Guidelines for screening mammography in

<p>Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning.</p>	<p>asymptomatic women.</p> <ul style="list-style-type: none"> • Know recommendations for imaging young female patients (under the age of 30) • Be able to describe masses and calcifications according to ACR Reporting System (BI-RADS). • Recognize the common mammographic features of benign and malignant pathology. • Be able to perform needle localizations on your own. • Obtain follow-up on all breast procedures that you perform and keep track of them for your resident procedure record. • Learn to do stereotactic biopsies. • Practice US guided core biopsy procedure on turkey breast, then participate in US guided cores at Cancer Center.
<p>Interpersonal and Communication Skills</p> <p>Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.</p>	<ul style="list-style-type: none"> • Be able to perform needle localizations on your own. • Obtain follow-up on all breast procedures that you perform and keep track of them for your resident procedure record. • Learn to do stereotactic biopsies. • Practice US guided core biopsy procedure on turkey breast, then participate in US guided cores at Cancer Center.
<p>Professionalism</p> <p>Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.</p>	<ul style="list-style-type: none"> • Be able to perform needle localizations on your own. • Obtain follow-up on all breast procedures that you perform and keep track of them for your resident procedure record. • Learn to do stereotactic biopsies. • Practice US guided core biopsy procedure on turkey breast, then participate in US guided cores at Cancer Center.
<p>Systems-based Practice</p> <p>Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.</p>	<p>Obtain follow-up on all breast procedures that you perform and keep track of them for your resident procedure record.</p>

Reading Material (available in the reading room or as PDF's on the desk top):

Kopans, DB. **Breast Imaging**. J.P. Lippincott Company, Philadelphia, Second Edition.

ACR Breast Imaging Reporting and Data System. The big blue binder, 4th edition.

Sickles EA. **Periodic Mammographic Follow-up of Probably Benign Lesions: Results in 3,184 Consecutive Cases**. Radiology 1991; 179:463-468.

LoRad Manual on Stereotactic Machine (PDF file in resident's folder).

Stavros AT, et al. **Solid Breast Nodules: Use of Sonography to Distinguish Between Benign and Malignant Lesions**. Radiology 1995; 196:123-34.

Sickles EA. **Mammographic Features of 300 Consecutive Nonpalpable Breast Cancers**. AJR 1986; 146:661-663.

Brenner RJ, Sickles EA. **Acceptability of Periodic Follow-up as an Alternative to Biopsy for Mammographically Detected Lesions Interpreted as Probably Benign**. RAD 1989; 171:645-6.

Bassett LW, Liu TH, Giuliano A, Gold RH. **The Prevalence of Carcinoma in Palpable vs. Impalpable, Mammographically Detected Lesions**. AJR 1999; 157:21-24.

UCSD Radiology Resident Breast Imaging 2nd Rotation'

Goals and Objectives

<p>Patient Care</p> <p>Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.</p>	<ul style="list-style-type: none">• Know the options for breast cancer treatment.• Know the radiographic appearances of the post-operative breast to include implant imaging problems.• Be familiar with mammography accreditation issues, ACR, HCFA, and State of California.• Know different types of breast cancer pathology and their prognostic consequences.• Know the appropriate work-up for benign, probably benign and malignant appearing lesions. Understand concept of "surveillance mammography".• Know acceptable histologic diagnosis for Mammographic abnormalities you biopsy.• QA: Phantom image: expose and score image. Do complete QA tests with technologists. Review physics QA report including star phantom (may be done with Tom Nelson or review of package available at the Women's Center).
<p>Medical Knowledge</p> <p>Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and socialbehavioral sciences, as well as the application of this knowledge to patient care.</p>	<ul style="list-style-type: none">• Know the options for breast cancer treatment.• Know the radiographic appearances of the post-operative breast to include implant imaging problems.• Be familiar with mammography accreditation issues, ACR, HCFA, and State of California.• Know different types of breast cancer pathology and their prognostic consequences.• Know the appropriate work-up for benign, probably benign and malignant appearing lesions. Understand concept of "surveillance mammography".• Know acceptable histologic diagnosis for Mammographic abnormalities you biopsy.• QA: Phantom image: expose and score image. Do complete QA tests with technologists. Review physics QA report including star phantom (may be done with Tom Nelson or review of package available at the Women's Center).

<p>Practice-based Learning and Improvement</p> <p>Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning.</p>	<ul style="list-style-type: none"> • Know the options for breast cancer treatment. • Know the radiographic appearances of the post-operative breast to include implant imaging problems. • Be familiar with mammography accreditation issues, ACR, HCFA, and State of California. • Know different types of breast cancer pathology and their prognostic consequences. • Know the appropriate work-up for benign, probably benign and malignant appearing lesions. Understand concept of “surveillance mammography”. • Know acceptable histologic diagnosis for Mammographic abnormalities you biopsy. • QA: Phantom image: expose and score image. Do complete QA tests with technologists. Review physics QA report including star phantom (may be done with Tom Nelson or review of package available at the Women’s Center).
<p>Interpersonal and Communication Skills</p> <p>Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.</p>	<ul style="list-style-type: none"> • Be familiar with mammography accreditation issues, ACR, HCFA, and State of California. • QA: Phantom image: expose and score image. Do complete QA tests with technologists. Review physics QA report including star phantom (may be done with Tom Nelson or review of package available at the Women’s Center).
<p>Professionalism</p> <p>Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.</p>	<ul style="list-style-type: none"> • Be familiar with mammography accreditation issues, ACR, HCFA, and State of California. • QA: Phantom image: expose and score image. Do complete QA tests with technologists. Review physics QA report including star phantom (may be done with Tom Nelson or review of package available at the Women’s Center).
<p>Systems-based Practice</p> <p>Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.</p>	<ul style="list-style-type: none"> • Be familiar with mammography accreditation issues, ACR, HCFA, and State of California. • QA: Phantom image: expose and score image. Do complete QA tests with technologists. Review physics QA report including star phantom (may be done with Tom Nelson or review of package available at the Women’s Center).

Reading Material:

Workbook for Quality Mammography by Caroline Kimme-Smith and Larry Bassett.

AAPM/RSNA Physics Tutorial for Residents- Digital Mammography, an Overview, Mahesh.
RadioGraphics 2004; 24:1747-1760.

Diseases of the Breast; Harris, Lippmann, Morrow, Osborne

Ductography How to What If, Slawson and Johnson. Radiographics 2001; 21:133-150.

Quality Assurance in Mammography: Artifact Analysis, Shaw de Paredes et. al., RadioGraphics
1999; 19:503-522.

UCSD Radiology Resident Breast Imaging 3rd Rotation

Goals and Objectives

<p>Patient Care</p> <p>Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.</p>	<ul style="list-style-type: none"> • Know indications & protocols for Breast MRI. • Know difference in protocol for breast implant evaluation v. breast parenchyma evaluation. • Review ACR guidelines for the performance of high quality breast MRI • Know criteria for benign and malignant MRI findings. • Review MR safety guidelines. • Observe MR guided biopsy, and then participate in MR biopsy. Biopsies are scheduled through Jerreccah. Contact Dr. Ojeda to discuss biopsy indications and make sure it is appropriate. Review images, plan approach, and follow up with pathology result. Make sure that key images are reformatted and downloaded as JPEG to have available in the MR suite.
<p>Medical Knowledge</p> <p>Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and socialbehavioral sciences, as well as the application of this knowledge to patient care.</p>	<ul style="list-style-type: none"> • Know indications & protocols for Breast MRI. • Know difference in protocol for breast implant evaluation v. breast parenchyma evaluation. Review ACR guidelines for the performance of high quality breast MRI. • Know criteria for benign and malignant MRI findings. • Review MR safety guidelines. • Observe MR guided biopsy, and then participate in MR biopsy. Biopsies are scheduled through Jerreccah. Contact Dr. Ojeda to discuss biopsy indications and make sure it is appropriate. Review images, plan approach, and follow up with pathology result. Make sure that key images are reformatted and downloaded as JPEG to have available in the MR suite. • Research Opportunity: Opportunities for clinical research are always available. We encourage and welcome residents to become involved in the academic efforts of the Breast Imaging section.
<p>Practice-based Learning and Improvement</p>	<ul style="list-style-type: none"> • Know indications & protocols for Breast MRI. • Know difference in protocol for breast implant

<p>Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning.</p>	<p>evaluation v. breast parenchyma evaluation.</p> <ul style="list-style-type: none"> • Review ACR guidelines for the performance of high quality breast MRI. • Know criteria for benign and malignant MRI findings. • Review MR safety guidelines. • Observe MR guided biopsy, and then participate in MR biopsy. Biopsies are scheduled through Jerreccah. Contact Dr. Ojeda to discuss biopsy indications and make sure it is appropriate. Review images, plan approach, and follow up with pathology result. Make sure that key images are reformatted and downloaded as JPEG to have available in the MR suite. • Research Opportunity: Opportunities for clinical research are always available. We encourage and welcome residents to become involved in the academic efforts of the Breast Imaging section.
<p>Interpersonal and Communication Skills</p> <p>Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals.</p>	
<p>Professionalism</p> <p>Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.</p>	<ul style="list-style-type: none"> • Review MR safety guidelines. • Research Opportunity: Opportunities for clinical research are always available. We encourage and welcome residents to become involved in the academic efforts of the Breast Imaging section.
<p>Systems-based Practice</p> <p>Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.</p>	<ul style="list-style-type: none"> • Review MR safety guidelines. • Observe MR guided biopsy, and then participate in MR biopsy. Biopsies are scheduled through Jerreccah. Contact Dr. Ojeda to discuss biopsy indications and make sure it is appropriate. Review images, plan approach, and follow up with pathology result. Make sure that key images are reformatted and downloaded as JPEG to have available in the MR suite. • Research Opportunity: Opportunities for clinical research are always available. We encourage and welcome residents to become involved in the academic efforts of the Breast Imaging section.

Required Reading:

Breast Cancer Imaging with MRI, E. Morris. Radiological Clinics of North America 2002, 443-466

Recognizing and Interpreting Artifacts and Pitfalls in MR Imaging of the Breast, H. Ojeda-Fournier, et al. Radiographics 2007; 27:S147-164.

Current Status of Breast MRI Clinical Applications, C. Kuhl. Radiology 2007; 244:3; 672-691

Breast MR Imaging editors Schnall & Orel in Clinics of North America, May 2001.

Breast Implant Imaging by Michael Middleton published 2002 by Lippincott, Williams & Wilkins

Mammography Service

DAILY ROUTINE:

WEEKLY BREAST IMAGING TEMPLATE:

Monday: Breast Conference: 7:45 am Mandatory

Diagnostic clinic: am pm

Screening: am pm

Procedures: am

MRI: pm

Tuesday: Diagnostic Clinic: am

Screening: am pm

Procedures: am pm

MRI: pm

Wednesday: Diagnostic Clinic: am pm

Lewis street am

Screening am pm

Procedures: am

MRI: pm

Thursday: Diagnostic Clinic: am pm

Screening: am pm

Procedures: am

MRI: am pm

Friday: Diagnostic Clinic: am

Screening: am pm

Procedures: am pm

MRI: pm

IMAGING GUIDELINES

American Cancer Society Guidelines for Breast Cancer Screening: Update 2003, *CA Cancer Journal* 2003;53;141-169

American Cancer Society Guidelines for Breast Cancer Screening with MRI as an Adjunct to Mammography, *CA Cancer Journal* 2007;57;75-89

TABLE 1

American Cancer Society Guidelines for Early Breast Cancer Detection, 2003	
Women at Average Risk	<p>Begin mammography at age 40.</p> <p>For women in their 20s and 30s, it is recommended that clinical breast examination be part of a periodic health examination, preferably at least every three years. Asymptomatic women aged 40 and over should continue to receive a clinical breast examination as part of a periodic health examination, preferably annually.</p> <p>Beginning in their 20s, women should be told about the benefits and limitations of breast self-examination (BSE). The importance of prompt reporting of any new breast symptoms to a health professional should be emphasized. Women who choose to do BSE should receive instruction and have their technique reviewed on the occasion of a periodic health examination. It is acceptable for women to choose not to do BSE or to do BSE irregularly.</p> <p>Women should have an opportunity to become informed about the benefits, limitations, and potential harms associated with regular screening.</p>
Older Women	<p>Screening decisions in older women should be individualized by considering the potential benefits and risks of mammography in the context of current health status and estimated life expectancy. As long as a woman is in reasonably good health and would be a candidate for treatment, she should continue to be screened with mammography.</p>
Women at Increased Risk	<p>Women at increased risk of breast cancer might benefit from additional screening strategies beyond those offered to women of average risk, such as earlier initiation of screening, shorter screening intervals, or the addition of screening modalities other than mammography and physical examination, such as ultrasound or magnetic resonance imaging. However, the evidence currently available is insufficient to justify recommendations for any of these screening approaches.</p>

TABLE 1 Recommendations for Breast MRI Screening as an Adjunct to Mammography

<p>Recommend Annual MRI Screening (Based on Evidence*)</p> <ul style="list-style-type: none"> BRCA mutation First-degree relative of BRCA carrier, but untested Lifetime risk ~20–25% or greater, as defined by BRCAPRO or other models that are largely dependent on family history
<p>Recommend Annual MRI Screening (Based on Expert Consensus Opinion†)</p> <ul style="list-style-type: none"> Radiation to chest between age 10 and 30 years Li-Fraumeni syndrome and first-degree relatives Cowden and Bannayan-Riley-Ruvalcaba syndromes and first-degree relatives
<p>Insufficient Evidence to Recommend for or Against MRI Screening‡</p> <ul style="list-style-type: none"> Lifetime risk 15–20%, as defined by BRCAPRO or other models that are largely dependent on family history Lobular carcinoma in situ (LCIS) or atypical lobular hyperplasia (ALH) Atypical ductal hyperplasia (ADH) Heterogeneously or extremely dense breast on mammography Women with a personal history of breast cancer, including ductal carcinoma in situ (DCIS)
<p>Recommend Against MRI Screening (Based on Expert Consensus Opinion)</p> <ul style="list-style-type: none"> Women at <15% lifetime risk

*Evidence from nonrandomized screening trials and observational studies.

†Based on evidence of lifetime risk for breast cancer.

‡Payment should not be a barrier. Screening decisions should be made on a case-by-case basis, as there may be particular factors to support MRI. More data on these groups is expected to be published soon.

Diagnostic Mammography

1. Scheduled only when radiologist is on site to direct work-up and give results to patient.
2. Make sure Category 4 and 5 reports are called to the referring clinician. State in report that the findings/recommendation were discussed with the patient and Dr. _____ was notified.
3. All category 4 & 5 reports must be telephoned to referring doctor. Please document in report that results were given to doctor and patient.
4. When requesting additional views, please annotate image with what views you want the tech to perform. Print the report and images. Place in call back bin in file room.
5. If you've given verbal results to patient and are not dictating the study immediately you must indicate in writing what you told the patient. Then you should dictate it first opportunity.
6. If you recommend a biopsy, make sure you state in report which way it is possible to do, i.e. can it be done stereotactically and/or with ultrasound guidance.
7. Please be careful with the wording of ultrasound reports. Indicate whether the palpable or radiographic abnormality is a cyst or not cystic.
8. Ultrasound Palpable Mass: Ultrasound dominant mass seen on mammo, so that we know if biopsy can be performed with reports entered into IDX RAD mammo module via laptop computer at view boxes. All studies must be completed at end of day.

BREAST IMAGING REPORTING DATA SYSTEM (BIRADS)

PARENCHYMAL PATTERN – must be included in report

CONCLUSION:

Category 0: Incomplete, needs further work-up and/or prior mammogram for comparison

Category 1: Negative: Nothing to talk about

Category 2: Benign finding – negative: definitely benign finding such as degenerated fibroadenoma.

Category 3: Probably benign finding Recommend short term follow-up: mass or calcifications which are 98%-99% benign, but should be followed in 6 months.

Category 4: Low suspicion: 10%-25% chance of malignancy needs to be biopsied.

Category 5: Highly suspicious: 90%-95% chance of being cancer, must biopsy.

Category 6: Known biopsy proven malignancy

NEEDLE LOCALIZATIONS

1. Check films day before procedure to make sure it can be seen on two views.
2. Make sure mammo staff is aware of procedure at least one day before it is scheduled.
3. Procedure: Patients are not to be sedated by anyone for this procedure. Obtain informed consent and have patient sign form. Make sure recent H & P is in medical record chart.
 - a. Obtain a compressed true lateral view before you start – remember, the usual diagnostic exam consists of an oblique rather than lateral view.
 - b. Try to use an approach in which the lesion is closet to skin. For example, if the lesion is in upper outer quadrant you may want to use biopsy compression grid in a lateral position for needle placement.
 - c. After needle placement, remove biopsy grid, and obtain a compressed film 90° to original film. If position is satisfactory, advance the hook wire about 1cm and obtain final film. Leave wire and needle in place.
 - d. Record procedure on stamped progress note; make sure final localization films are clearly marked as “final”. The original 2 views of that breast from the diagnostic mammogram and the two films showing needle placement should go to the OR with patient.
 - e. Contact the surgeon, particularly if needle placement was difficult or you find that position is less than perfect. It is preferable to personally review final films with surgeon before surgery.
 - f. The specimen is radiographed in the OR faxitron and transmitted via PACS. Image must be seen by an attending radiologist who will confirm the presence of the lesion and then contact the surgeon immediately: one specimen radiograph returns to pathology for their records.
 - g. A needle–localization log is maintained in mammo room by the techs. Make sure it is completed along with the Quality Assurance Report.

STEREOTACTIC AND ULTRASOUND GUIDED CORE BIOPSIES

Assigned resident is to review case, print images and preview with appropriate attending the day before the procedure.

1. Review cases before schedule to insure it is do-able.
2. Obtain informed and signed consent. Fill out data sheets and make sure you have patient contact phone numbers.
3. At end of procedure make sure patient is given printed breast care instruction sheet.
4. Call patient next morning to check on status. Make sure patient receives results within 48 hours. Radiologist calls patient with benign results, call the surgeon with malignant results and

they will call the patient and set up follow-up appointments.

5. After final path report back, enter procedure into MagView module with benign or malignant results. Make sure the pathology is concordant with the imaging studies. If not, decide if excision is necessary.

Billing codes

6180101 **Diagnostic mammogram** – patients with symptoms, previous diagnosis of cancer or following abnormal mammogram. Patient needs to be examined by a radiologist who tells her mammo results.

6180105 **Screening mammogram** – must be asymptomatic, does not get physical exam and is not told the results.

6180103 **Low cost** – patient pays cash in advance, must be asymptomatic.

6180108 **Mammogram augmented** – routine two views of each breast plus implant-displaced views.

6180104 **Additional views** – used for patients who

6180106 had screening or low cost exam if they need additional views.

6180100 **Unilateral mammogram**

6180112 **Ultrasound**

6180111 No show mammogram

Breast Imaging and Interventions Course: Residents are welcomed to attend the Fall breast imaging course. Please discuss with Ojeda if you are interested. Will need to attend all 2 and ½ days of the conference. Senior residents are strongly encouraged to attend conference.

MR Intervention's course: Several times during the year we offer a Breast MR interventions course sponsored by industry. Please contact Dr. Ojeda for further details.