Florida Hospital Diagnostic Radiology Residency  
Women’s (Breast) Imaging Goals and Objectives  
Training Location: FRI (Florida Radiology Imaging) Princeton

Many of the goals and objectives apply to all rotations and are listed below. Those goals that are more specific to a particular rotation are listed separately.

Women’s Imaging Curriculum

The educational curriculum in Women’s Imaging is comprised primarily of the rotations through the Women’s Imaging Section at FH Orlando and FRI Princeton where the Faculty provide direct training and supervision; as well as, a comprehensive series of lectures and conferences in Women’s Imaging. Correlation is made on a case-by-case basis with other imaging modalities, facilitated by the PACs system. A series of interdepartmental conferences, grand rounds, Journal Clubs, meetings and other venues are expected to enhance the residents’ knowledge of Women’s Imaging.

The residents will participate in the day-to-day interpretation of diagnostic and screening mammography, as well as problem solving involving Breast US and Breast MRI. They will be exposed to and have opportunities to review cases which utilize advanced technology in interpretation such as Computer Aided Detection in mammography and MRI, Automated Breast Ultrasound and Digital Breast Tomosynthesis. The resident will become familiar with the fundamentals of Mammographic positioning, technique, and quality control, and will use MQSA-approved BI-RADS lexicon in generating reports. They will receive hands-on training in breast US and it is expected that the resident will participate directly in scanning patients.

The resident will be trained in and expected to perform a variety of interventional breast procedures, including Stereotactic guided Core Needle Biopsy, Mammographically guided Needle Localization, Mammographically guided Radioactive Seed Localization, Ultrasound guided Cyst Aspiration, Ultrasound guided Core Needle Biopsy, MRI guided Core Biopsy and both Radioactive Seed and Needle Localization guided by US.

Residents are expected to participate in all the clinical activities of the Breast Imaging Service, including the real time monitoring of studies, previewing images for procedures, obtaining informed consent from patients, case review with breast surgeons and referring physicians as well as preparation for and attendance at the breast multi-disciplinary conferences for the upperclassmen. The upper-class resident will have the primary responsibility of presenting cases at the conference. This will enrich the resident’s understanding of the clinical, pathologic, and therapeutic issues of breast imaging.

Daily Required Reading Minimum

On all rotations, residents are required to read a minimum of cases per day.

On the Women’s Rotation the 1st and 2nd year residents are to read a minimum of 120 cases over a total of four weeks. 3rd and 4th year residents are required to read a minimum of 240 cases over a total of four weeks. If this cannot be met, a written explanation must be provided to the section head.
by the resident on service.

**Screening Mammogram cases** – 1st through 3rd year residents are encouraged to read approximately 10 screens per day while on service. 4th year residents are encouraged to read 25-30 cases per day.

A summarized curriculum for the Women’s’ Imaging Section follows:

**Epidemiology**
- Risk factors
- Staging in survival rates

**Breast anatomy, pathology, and physiology**
- Breast development
- Normal and developmental breast anatomy and histology; alteration with the age, pregnancy, menstrual cycle, and hormonal effects
- Mammographic appearance, pathologic correlation and clinical significance of benign breast conditions, such as fibroadenoma, cysts, papilloma, hamartoma, lipoma, ductal ectasia, radial scar, and fat necrosis
- Atypical ductal hyperplasia, lobular neoplasia, and other histologic risk factors
- Pathologic and mammographic appearance, clinical features, significance, and prognosis of ductal carcinoma in situ and lobular carcinoma in situ
- Pathologic and mammographic appearance, clinical features and prognosis of invasive carcinoma, including invasive ductal carcinoma not otherwise specified, mucinous, medullary, papillary, tubular subtypes, and invasive lobular carcinoma
- Other manifestations of breast cancer, such as Paget’s disease and inflammatory carcinoma
- Histologic grading
- Pathologic staging
- Multi-focal and multicentric carcinoma
- Margin analysis for specimens containing ductal carcinoma in situ

**Mammographic Equipment and Technique**
- Features of mammographic equipment units including target, filtration, automatic exposure control, and grids
- Equipment requirements for American College of Radiology accreditation and Mammography Quality Standards Act (MQSA) certification
- Familiarity with American College of Radiology recommended specifications for new mammography equipment
- Characteristics of mammographic film screen systems and Full Field Digital Mammography
- Positioning technique for craniocaudal and mediolateral oblique views
- View box (Digital Display) criteria for assessment of positioning, compression, exposure, contrast, sharpness, and noise
- Rationale for breast compression
- Selection of technical factors, including effects of milliampere seconds (mAs), kilovolt peak (KVP) and density settings on image quality
• Film processing, Digital Acquisition
• Factors affecting exposure contrast, noise, and sharpness
• Need for dedicated high intensity view boxes, or high resolution digital monitors, view box masking, and magnifying glass and digital tools
• Standardized labeling of images
• Principles of Digital Breast Tomosynthesis

Mammography Quality Control
• Purpose and frequency of performance of those quality control tests performed by technologist including phantom images and processor densitometry
• Appearance and causes of artifacts, such as roller marks, grid lines, motion unsharpness, dust, poor screen-film contrast, pickoff, and scratches
• Requirements and standards for American College of Radiology Mammography Accreditation and the Food and Drug Administration MQSA certification
• Familiarity with the American College of Radiology mammography quality control manual

Mammographic interpretation
• Normal mammographic anatomy and parenchymal patterns
• Mammographic features of typically benign calcifications, such as those caused by sclerosing adenosis, fibroadenoma, fat necrosis, secretory disease, sebaceous gland calcification, dystrophic calcification and dermal calcifications
• Mammographic features of calcifications of intermediate concern and those having a higher probability of malignancy
• Significance of distribution of calcifications
• Mammographic features of benign masses and densities, such as asymmetric breast tissue, radial scar, hematoma, abscess, cysts, fibroadenoma, intramammary lymph node, hormonal replacement therapy, phyllodes tumor, hamartoma, gynecomastia, lipoma, fat necrosis, edema, ductal ectasia, intracystic papilloma, and Mondor’s disease
• Mammographic appearance of malignant masses, densities and architectural distortion caused by in situ and invasive ductal carcinoma, invasive lobular carcinoma, and metastases to the breast
• Knowledge of the ACR BI-RADS Lexicon

Problem Solving Mammography
• ACR practice standard for the performance of diagnostic mammography
• Technique, value, and indications for supplementary mammographic views, such as tangential, 90 degree mediolateral, spot compression, exaggerated rotated craniocaudal, cleavage; blind areas of the breast
• Technique for documentation of clustered skin calcifications
• Criteria and methods for distinguishing focal asymmetric densities, asymmetric breast tissue, and breast masses
• Technique for evaluation of implants, and implant rupture
• Masses: criteria and methods for assessment by mammography and sonography: likelihood of malignancy
• Calcification: criteria for mammographic assessment
Magnification mammography: advantages and disadvantages, technique, doses, and indications
Localization of lesions seen on only one view; triangulation
Criteria for biopsy and follow-up of masse, calcifications, and soft tissue densities
Ability to perform breast physical examination
Evaluation and management of a palpable mass with no mammographic findings

**Breast Ultrasound**
- Equipment and physical principles
- Technique
- Hands-on experience
- Indications
- Normal sonographic anatomy
- Features of cysts
- Differential features of benign and malignant solid masses
- Limitations: detection and differentiation of microcalcifications:
- Need for correlation with mammography
- Criteria and reliability for evaluation of implant rupture
- ACR standard for the performance of breast ultrasound

**Interventional Procedures**
- Principles, indications, and contraindications, equipment, technique, advantages, disadvantages, accuracy, preparation, and follow-up for the following
- Needle wire localization (mammographically, sonographically, stereotactically and MRI guided)
- Radioactive seed localization (as above)
- Stereotactic core biopsy
- Ultrasound guided core biopsy and FNA
- MRI guided core biopsy
- Ultrasound guided cyst aspiration
- Galactography/Ductography
- Pneumocystography
- Specimen radiography, including paraffin block radiography
- Clinical Management: importance of correlation of pathologic findings with history, mammographic and sonographic findings in determining patient management
- ACR standard for the performance of stereotactically guided breasts interventional procedures
- ACR standard for the performance of ultrasound guided percutaneous breast interventional procedures

**Mammographic Reporting and Medical Legal Aspects of Mammography**
- American College of Radiology BI-RADS terms for the following:
- Categorization of breast composition
- Lesion location
- Mass: shape, margins, and density
- Typically benign, intermediate concern and higher probability of malignancy calcifications
• Distribution modifiers for calcification
• Associated findings
• Final assessment categories
• Medical legal aspects of screening, problem solving mammography, and interventional procedures

Screening Mammography
• ACR practice standards for screening mammography
• Knowledge of practical aspects of performance and interpretation of screening mammography
• Mammographic audit: definition and desirable goals for positive predictive value, percentage stage at the zero or stage one tumors, minimal carcinomas, note positivity, prevalent and incident cancer rates, recall rates, sensitivity, specificity, and false negative rate
• Relative efficacy of physical examination, breast self-examination, and mammography
• Screening theory: lead time bias, length bias, selection bias, survival rates, prevalence versus incidence screening, definition of lead time, and interval cancer rate
• Value of double reading
• Radiation risk versus screening benefit
• Cost effectiveness of screening
• Randomized clinical trials, case control studies, and follow-up studies: purpose, methods, and results
• Controversies regarding screening
• Screening guidelines of the American College of Radiology, American Cancer Society, National Cancer Institute

Breast MRI
• Indications
• Technique
• Dynamic Enhancement Kinetics
• Characteristics of benign and malignant breast masses
• Architectural Distortion, Scar versus recurrence
• Cysts, Skin Thickening, Lymphadenopathy and other associated findings
• Implant Integrity

Therapeutic consideration
• Role of breast imaging in selection and monitoring of breast cancer treatment and post-treatment follow-up
• Basic understanding of breast cancer treatment options
• ACR standard for diagnosis and management of invasive breast carcinoma therapy
• ACR standard for diagnosis and management of ductal carcinoma in situ

Patient Management Principles
• Patient interaction and communication
• Informed consent for invasive procedures
• Follow-up procedures for positive findings
Training using the ACGME Six-Core Competencies:

Year 1: Breast Imaging Curriculum

1) Patient Care: At the end of the rotation, the resident should be able to:
   - Assess and reinforce utilization of patient history, clinical exam and lab tests as basis of image interpretation and breast interventional procedure performance- e.g. Residents should review clinical and radiological history before performing procedure.
   - Assess and reinforce development of image strategy to assess clinical problem/question, develop customized breast imaging workup and ability to recommend and choose appropriate imaging procedure; e.g. When to perform breast ultrasound versus MRI, when to recommend surgical consultation versus image guided biopsy versus close interval surveillance?
   - Assess and reinforce resident respectful communication with and counseling of patients during performance of breast interventional procedures; e.g., appropriate discussion of informed consent. Residents should be closely monitored during patient interaction in procedure room.
   - Assess and reinforce working knowledge of levels/risks of ionizing radiation as well as safety procedures pertaining to Mammographic imaging, demonstrate exam specific radiation dose and ALARA
   - Assess and reinforce appropriate, competent and safe performance of breast interventional procedures such as ultrasound guided cyst aspiration, image guided breast biopsy, image guided wire localization and radioactive seed localization; e.g. hands on direct supervision of complex procedures. Reinforce need to follow up with patient and laboratory for patient wellbeing and histopathologic results.
   - Assess and reinforce use of BIRADS lexicon in creating a clear report and facilitate direct communication with (and documentation of) referring physicians as indicated.

Milestones include:
   - Using established evidence based guidelines such as ACR appropriateness criteria
   - Appropriately use the electronic health record to obtain relevant clinical information
   - Competently perform basic decision making for studies under indirect supervision
   - Recognize and manage complications of basic procedures

2) Medical Knowledge: At the end of the rotation, the resident should be able to:
   - Assess and reinforce knowledge of normal and developmental anatomy, histology and pathology of the breast during image interpretation and when in breast interventional procedures
   - Assess and reinforce resident use of recommended breast imaging texts and websites and correct use of ACR BIRADS lexicon. Encourage participation in journal club, radiation safety lectures and in preparation of multidisciplinary conference.
   - Assess and reinforce common breast clinical and scientific concepts such as imaging in differentiation of benign versus malignant neoplasia, differentiation of in situ versus invasive breast neoplasia, solitary versus multifocal versus multicentric disease and staging of breast carcinoma.
   - Assess and reinforce resident’s ability to apply these concepts in image interpretation and performance of breast interventional procedures.
Expected Reading List:
- Fundamentals of Diagnostic Radiology (Brant & Helm) – Women’s Imaging Chapter
- Breast Imaging (Kopans)
- Breast Imaging - Companion
- Breast Imaging – The Requisites
- Breast MRI Textbook
- Clinical Breast Imaging

Milestones include:
- Selecting appropriate study and modality to evaluate breast pathology
- Makes core observations
- Formulate differential diagnoses
- Recognize critical findings
- Differentiate normal from abnormal

3) Practice Based Learning and Improvement: At the end of the rotation, the resident should be able to:
- Assess and reinforce resident ability to analyze practice experience and performance of practice based improvement activities using systematic methodology. Are residents participating in QA and applying knowledge gained?
- Assess and reinforce resident location, appraisal and assimilation of evidence from scientific studies related to relevant issues raised during image interpretation. Are residents reading appropriate breast imaging literature and bringing that knowledge to the view box?
- Assess and reinforce application of knowledge of study design and statistical methods as well as information on diagnostic and therapeutic effectiveness
- Assess and reinforce use of appropriate information technology to manage information and to support their education. Are residents using PACs efficiently and do they know all tools relevant to breast interpretation?
- Assess and reinforce resident education of other medical professionals and students. Are residents assisting in student education at breast image interpretation?

Milestones include:
- Demonstrates appropriate follow up of interesting cases
- Demonstrates knowledge gained from independent study as applied to relevant cases
- Describes the mechanism of radiation injury and the ALARA concept as it applies to Breast imaging
- Documents training in critical thinking skills and research design

4) Interpersonal and Communication: At the end of the rotation, the resident should be able to:
- Assess and reinforce resident creation of therapeutic and ethical sound relationship with patients.
- Assess and reinforce resident effective listening skills and ability to elicit and provide information. Assess during informed consent before breast interventional procedures.
- Assess and reinforce resident ability to work effectively with others as team leader or member. Are residents team focused in the breast interventional procedural areas?

Milestones include:
- Communicating information about imaging and examination results in routine, uncomplicated cases
- Obtains informed consent
- Adhere to transfer of care policies
- Generates accurate reports with appropriate elements for coding
- Communicates urgent and unexpected findings according to RSF policy

5) **Professionalism:** At the end of the rotation, the resident should be able to:
   - Respect patient confidentiality at all times
   - Demonstrate altruism
   - Demonstrate compassion (be understanding and respectful of patient, their families, and medical colleagues)
   - Demonstrate excellence: perform responsibilities at the highest level and continue active learning throughout one’s career
   - Demonstrate honesty with patients and staff
   - Demonstrate honor and integrity: avoid conflict of interest when accepting gifts from patients and vendors
   - Demonstrate sensitivity without prejudice on the basis of religious, ethnic, sexual, or educational differences and without employing sexual or other types of harassment
   - Demonstrate knowledge of issues of impairment
   - Demonstrate positive work habits, including punctuality and professional appearance
   - Demonstrate the broad principles of biomedical ethics

Milestones include:
- Recognizing the importance and priority of patient care and advocates for patient interests
- Fulfills work related responsibilities
- Recognizes personal limitations and seeks help when appropriate
- Responds appropriately to constructive criticism
- Maintains patient confidentiality
- Attends required meetings

6) **Systems Based Practice:** At the end of the rotation, the resident should be able to:
- Assess and reinforce resident knowledge of types of medical practice and delivery systems, including methods of cost control and resource allocation. For example, are image recommendations in breast reports cost conscious?
- Assess and reinforce use of cost effective health care that does not compromise quality of care. For example; are we ordering extra views which are not necessary? will a more expensive examination change the management of the patient or do we have enough information to make recommendation without it? Is there excessive wasting of needles or catheters during procedures?
- Assess and reinforce advocacy for quality patient care and assisting patients dealing with system complexity. Understanding funding sources and insurance limitations.
- Assess and reinforce resident partnering with health care managers and other providers to assess and coordinate proper care. For example, during procedures monitor interaction with technologists, nursing staff
- Assess and encourage membership in and participation in local and national radiologic societies.
Milestones include:
- Describes departmental QI initiatives
- Describes the departmental QA system

**Year 2: Breast Imaging Curriculum**

1) **Patient Care:** At the end of the rotation, the resident should be able to:
   - Gather clinical and radiographic data on patients with breast lesions
   - Develop diagnostic plan based on the clinical presentation and prior imaging
   - Oversee customized breast imaging workups
   - Counsel patients concerning exam preparations
   - Demonstrate Basic understanding of mammographic report tracking
   - Perform exams responsibly and safely, assuring that the correct exam is ordered and performed
   - Demonstrate understanding of exam specific radiation doses and ALARA

Milestones include:
- Recommends appropriate imaging of common presentations independently
- Competently performs intermediate procedures (needle localizations, ultrasound guided needle localizations, radioactive seed localization, ultrasound guided cyst aspiration)
- Recognizes and manages complications of intermediate procedures

2) **Medical Knowledge:** At the end of the rotation, the resident should be able to:
   - Demonstrate sufficient knowledge of breast disease and its proper application to generate meaningful differential diagnoses
   - Demonstrate progress during subsequent rotations
   - Demonstrate understanding of the principles of research project design and implementation
   - Demonstrate a clinically appropriate diagnostic treatment plan
   - Demonstrate the ability to use all relevant information resources to acquire evidence based data
   - Demonstrate the proper use of radiological equipment
   - Mammographic equipment and techniques
   - Mammographic reporting and medical legal aspects of mammography
   - Patient management principles
   - How to perform needle localizations
   - How to perform US guided cyst aspirations
   - How to perform US guided needle localizations and radioactive seed localization

**Expected Reading List:**
- Breast Imaging (Kopans)
- Breast Imaging - Companion
- Breast Imaging – The Requisites
- Breast MRI Textbook
- Clinical Breast Imaging
Milestones include:
- Selects appropriate supplemental imaging after review of history and imaging
- Makes secondary observations
- Narrows differential diagnosis
- Describes management options

3) Practice-Based Learning and Improvement: At the end of the rotation, the resident should be able to:
- Analyze and develop improvement plans in the clinical practice, including knowledge, observation, and procedural skills
- Demonstrate knowledge of and apply the principles of evidence-based medicine in practice
- Help teaching of medical students, peers and other health care professionals

Milestones include:
- Utilizes ACR criteria for determining imaging and treatment decision
- Accesses resources to determine exam specific average radiation dose info
- Accesses resources to determine safety of implanted devices & retained metal prior to MRI
- Works with faculty mentors to identify potential scholarly projects

4) Interpersonal and Communication Skills: Residents must demonstrate skills to:
- Provide a clear report based on BI-RADS Lexicon
- Provide direct communication to referring physicians, and documenting communication in report
- Demonstrate skills in obtaining informed consent, including effective communication to patients of the procedure, alternatives, and possible complications
- Demonstrate the verbal and non-verbal skills necessary for face to face listening and speaking to physicians, families, and support personnel

Milestones include:
- Communicates under direct supervision in challenging circumstances
- Communicates under direct supervision difficult information such as errors, complications, adverse events, and bad news
- Efficiently generates clear and concise reports that do not require substantive faculty member correction on routine cases
- Communicates findings and recommendations clearly and concisely

5) Professionalism: At the end of the rotation, the resident should be able to:
- Demonstrate altruism
- Demonstrate compassion (be understanding and respectful of patient, their families, and medical colleagues)
- Demonstrate excellence: perform responsibilities at the highest level and continue active learning throughout one’s career
- Demonstrate honesty with patients and staff
- Demonstrate honor and integrity: avoid conflict of interest when accepting gifts from patients and vendors
• Demonstrate sensitivity without prejudice on the basis of religious, ethnic, sexual, or educational differences and without employing sexual or other types of harassment
• Demonstrate knowledge of issues of impairment
• Demonstrate positive work habits, including punctuality and professional appearance
• Demonstrate the broad principles of biomedical ethics
• Demonstrate principles of confidentiality with all information transmitted during a patient encounter

Milestones include:
- Becomes an effective health care team member
- Continues to demonstrates professional behaviors described under year 1

6) Systems-Based Practice: At the end of the rotation, the resident should be able to:
• Demonstrate ability to design cost-effective care plans
• Demonstrate knowledge of funding sources
• Demonstrate knowledge of reimbursement methods
• Demonstrate knowledge of the regulatory environment
• Demonstrate knowledge of basic management principles such as budgeting, record keeping, medical records, and the recruitment, hiring, supervision and management of staff

Milestones include:
- Incorporating QI into clinical practice
- Participates in the QA department process
- States relative cost of common procedures

Year 3: Breast Imaging Curriculum

1) Patient Care: At the end of the rotation, the resident should be able to:
• Gather clinical and radiographic data on patients with breast lesions
• Develop diagnostic plan based on the clinical presentation and prior imaging
• Oversee customized breast imaging workups
• Counsel patients concerning exam preparations
• Demonstrate basic knowledge of Breast report tracking, MQSA requirements
• Perform exams responsibly and safely, assuring that the correct exam is ordered and performed
• Demonstrate exam specific radiation doses and ALARA

Milestones include:
- Recommends appropriate imaging of uncommon conditions independently
- Integrates current research and literature with guidelines, taking into consideration cost effectiveness and risk benefit analysis, to recommend imaging
- Competently performs advanced procedures
- Recognizes and manages complications of advanced procedures
- Independently performs image guided breast procedures with supervision

2) Medical Knowledge: At the end of the rotation, the resident should be able to:
- Demonstrate sufficient knowledge of medicine and its proper application to generate meaningful differential diagnoses
- Demonstrate progress during subsequent rotations
- Demonstrate understanding of the principles of research project design and implementation
- Demonstrate a clinically appropriate diagnostic treatment plan
- Demonstrate the ability to use all relevant information resources to acquire evidence based data
- Demonstrate the proper use of radiological equipment
- Mammographic quality control
- Learning principles of interpretation in Breast MRI
- Therapeutic Consideration
- How to perform US guided FNA
- How to perform galactograms
- How to perform pneumocystograms
- How to perform stereotactic core biopsy
- How to perform US guided core biopsy
- How to perform MRI guided core biopsy

**Expected Reading List:**
- Breast Imaging (Kopans)
- Breast Imaging - Companion
- Breast Imaging – The Requisites
- Breast MRI Textbook
- Clinical Breast Imaging

Milestones include:
- Selects appropriate protocols and contrast agent/dose for advanced imaging
- Demonstrates knowledge of physical principles to optimize imaging quality
- Independently modifies protocols as determined by clinical circumstances
- Provides accurate, focused, and efficient interpretations
- Prioritizes differential diagnoses and recommends management
- Makes subtle observations
- Suggests a single diagnosis when appropriate
- Integrates current research and literature with guidelines to recommend management

3) Practice-Based Learning and Improvement: At the end of the rotation, the resident should be able to:
- Analyze and develop improvement plans in the clinical practice, including knowledge, observation, and procedural skills
- Demonstrate knowledge of and apply the principles of evidence-based medicine in practice
- Prepare and present cases to multidisciplinary case conference / Tumor Board

Milestones include:
- Communicates the relative risk of exam specific radiation exposure to patients and practitioners. Applies principles of image Gently and Wisely
- Communicates MR safety of common implants and retained foreign bodies to patients and practitioners
4) **Interpersonal Skills:** Residents must demonstrate skills to:
- Provide a clear report. Based on BI-RADS Lexicon
- Provide direct communication to referring physicians, and documenting communication in report
- Demonstrate skills in obtaining informed consent, including effective communication to patients of the procedure, alternatives, and possible complications
- Demonstrate the verbal and non-verbal skills necessary for face to face listening and speaking to physicians, families, and support personnel

Milestones include:
- Communicates without supervision in challenging circumstances
- Efficiently generates clear and concise reports that do not require substantive faculty member correction on all cases
- Communicates appropriately under stressful situations

5) **Professionalism:** Residents must demonstrate skills to:
- Demonstrate altruism
- Demonstrate compassion (be understanding and respectful of patient, their families, and medical colleagues)
- Demonstrate excellence: perform responsibilities at the highest level and continue active learning throughout one’s career
- Demonstrate honesty with patients and staff
- Demonstrate honor and integrity: avoid conflict of interest when accepting gifts from patients and vendors
- Demonstrate sensitivity without prejudice on the basis of religious, ethnic, sexual, or educational differences and without employing sexual or other types of harassment
- Demonstrate knowledge of issues of impairment
- Demonstrate positive work habits, including punctuality and professional appearance
- Demonstrate the broad principles of biomedical ethics
- Demonstrate principles of confidentiality with all information transmitted during a patient encounter

Milestones include:
- Is an effective team leader promoting patient welfare, patient autonomy, and social justice
- Serves as a role model for professional behavior

6) **Systems-Based Practice:** Residents must demonstrate skills to:
- Demonstrate ability to design cost-effective care plans
- Demonstrate knowledge of funding sources
- Demonstrate knowledge of reimbursement methods
- Demonstrate knowledge of the regulatory environment
- Demonstrate knowledge of basic management principles such as budgeting, record keeping, medical records, and the recruitment, hiring, supervision and management of staff

Milestones include:
- Identifying and completing a systems based practice project
**Year 4: Breast Imaging Curriculum**

- 4th year residents will read in Orlando, at an approved mammo reading station.
- 1st-3rd year residents will read at Princeton. If there is no 1st-3rd year on rotation, the 4th year will read at Princeton.
- Breast biopsies/localizations at Princeton will be shared by the residents on service.
- Read screens off the Orlando list, to be read out with Turner/Landrieu at Pensacola.
- Read screens from East Division, read out with the Princeton attending.
- Readout of screens with the IR Float attending may occur.
- Be the first in-line to receive off-site diagnostic mammograms from Lake Nona, Winter Garden, and/or other facilities, which are distributed by phone to the Women’s Rads by the RFs.
- 4th years should work-up the patient as independently as possible (additional views, US, patient history assessment, etc.), receiving telephone guidance/oversight from a Women’s rad.

1) **Patient Care:** At the end of the rotation, the resident should be able to:
   - Gather clinical and radiographic data on patients with breast lesions
   - Independently develop diagnostic plan based on the clinical presentation and prior imaging
   - Oversee customized breast imaging workups
   - Perform exams responsibly and safely, assuring that the correct exam is ordered and performed
   - Counsel patients concerning exam preparations
   - Demonstrate knowledge of Breast report tracking, **MQSA** requirements
   - Understands exam specific radiation doses and ALARA

Milestones include:
- Independently recommends appropriate imaging of uncommon conditions
- Integrates current research and literature with guidelines, taking into consideration cost effectiveness and risk benefit analysis, to recommend imaging
- Independently performs image guided breast procedures
- Recognizes and manages complications of breast procedures

2) **Medical Knowledge:** At the end of the rotation, the resident should be able to:
   - Demonstrate advanced knowledge of medicine and its proper application to generate meaningful differential diagnoses
   - Demonstrate advanced depth of knowledge of breast conditions and appropriate management, including a clinically appropriate diagnostic treatment plan
   - Demonstrate understanding of the principles of research project design and implementation
   - Demonstrate the ability to use all relevant information resources to acquire evidence based data
   - Demonstrate the proper use of radiological equipment
   - Mammographic quality control
   - Advanced evaluation and interpretation of breast MRI and appropriate recommendations
   - Mastery of performance of US guided FNA
   - Mastery of performance of galactograms
Mastery of performance of stereotactic core biopsy
Mastery of performance of US guided core biopsy
Mastery of performance of MRI guided core biopsy

Expected Reading List:
- Breast Imaging (Kopans)
- Breast Imaging - Companion
- Breast Imaging – The Requisites
- Breast MRI textbook
- Clinical Breast Imaging

Milestones include:
- Selects appropriate protocols and contrast agent/dose for advanced imaging
- Demonstrates advanced knowledge of physical principles to optimize imaging quality
- Independently modifies protocols as determined by clinical circumstances
- Provides accurate, focused, and efficient interpretations independently
- Prioritizes differential diagnoses and recommends management
- Makes subtle observations
- Suggests a single diagnosis when appropriate
- Integrates current research and literature with guidelines to recommend management

3) Practice-Based Learning and Improvement:  At the end of the rotation, the resident should be able to:
- Analyze and develop improvement plans in the clinical practice, including knowledge, observation, and procedural skills
- Demonstrate advanced knowledge of and apply the principles of evidence-based medicine in practice
- Prepare and present cases to multidisciplinary case conference / Tumor Board
- Teaching of medical students, peers and other health care professionals

Milestones include:
- Communicates the relative risk of exam specific radiation exposure to patients and practitioners. Applies principles of image Gently and Wisely
- Communicates MR safety of common implants and retained foreign bodies to patients and practitioners

4) Interpersonal Skills:  Residents must demonstrate skills to:
- Provide a clear report based on BI-RADS Lexicon
- Provide direct communication to referring physicians, and documenting communication in report
- Demonstrate skills in obtaining informed consent, including effective communication to patients of the procedure, alternatives, and possible complications
- Demonstrate the verbal and non-verbal skills necessary for face to face listening and speaking to physicians, families, and support personnel

Milestones include:
- Communicates without supervision in challenging circumstances
- Efficiently generates clear and concise reports that do not require substantive faculty member correction on all cases
- Communicates appropriately under stressful situations

5) **Professionalism:** Residents must demonstrate skills to:
   - Demonstrate altruism
   - Demonstrate compassion (be understanding and respectful of patient, their families, and medical colleagues)
   - Demonstrate excellence: perform responsibilities at the highest level and continue active learning throughout one’s career
   - Demonstrate honesty with patients and staff
   - Demonstrate honor and integrity: avoid conflict of interest when accepting gifts from patients and vendors
   - Demonstrate sensitivity without prejudice on the basis of religious, ethnic, sexual, or educational differences and without employing sexual or other types of harassment
   - Demonstrate knowledge of issues of impairment
   - Demonstrate positive work habits, including punctuality and professional appearance
   - Demonstrate the broad principles of biomedical ethics
   - Demonstrate principles of confidentiality with all information transmitted during a patient encounter

Milestones include:
- Is an effective team leader promoting patient welfare, patient autonomy, and social justice
- Serves as a role model for professional behavior

6) **Systems-Based Practice:** Residents must demonstrate skills to:
   - Demonstrate ability to design cost-effective care plans
   - Demonstrate knowledge of funding sources
   - Demonstrate knowledge of reimbursement methods
   - Demonstrate knowledge of the regulatory environment
   - Demonstrate knowledge of basic management principles such as budgeting, record keeping, medical records, and the recruitment, hiring, supervision and management of staff

Milestones include:
- Identifying and completing a systems based practice project

**Assessment tools for all Women’s Imaging Rotations:**
- Reviewing rotation curriculum and the goals and objectives, as a benchmark for monitoring the progress of the resident, as well as the evaluating the success of faculty in educating the resident. Discussion regarding the specifics of the document is encouraged to promote improvement of the resident’s learning and the program’s teaching. Positive points and deficiencies and unfulfilled goals and objectives should be discussed by the residents and faculty
- Global ratings by faculty including rotation evaluation sheet
- Resident’s performance discussing unknown cases in conference (one of the metrics on Global Evaluation sheet)
- Placing cases in teaching file (one of the metrics on Global Evaluation)
• Conference attendance logs
• In-service examination
• 360 degree evaluations – supervisory technologists in radiology core
  Self-assessment based on Rad Primer quizzes
• Evaluation of teaching by medical students

**ACGME Required Documentation of Case & Procedure Logs:**
- Mammography (300)
- Imaging Guided Bx (25 total)

**The Mammography Quality Standards Act (MQSA)**
**Breast Imaging Experience Requirements**

Starting with the medical residency graduating classes of 2014, the American Board of Radiology (ABR) will require each resident to demonstrate proficiency across all of diagnostic radiology by completing a Comprehensive Core Examination after 36 months of residency training. This examination will be followed by a Final Certifying Examination administered 15 months after the resident graduates from the medical residency program. Graduates will no longer have the opportunity to become board certified by the ABR during the medical residency.

In order to immediately begin independent interpretation of mammograms following a residency program, medical residency graduates of 2014 or later must:

Have interpreted 240 mammographic examinations under direct supervision within any 6-month period during the last two years of the medical residency. (That is, for newly graduating medical residents, the interpretation of the 240 exams may be during any 6-month period during the last 2 years of the residency program, as opposed to the last six months of the residency program, as was previously required.)

Have completed 3 months of formal training in the interpretation of mammograms and in topics related to mammography (including instruction in radiation physics specific to mammography, radiation effects, and radiation protection).

Have completed a minimum of 60 category I hours of documented medical education in mammography (including instruction in the interpretation of mammograms, basic breast anatomy, pathology, physiology, technical aspects of mammography, and quality assurance and quality control in mammography), with at least 15 of the category I hours having been acquired within the 3 years immediately prior to the date that the physician qualified as an interpreting physician.

A new residency letter template is available on the MQSA webpage. The new residency letter template is applicable only for residents who graduate in June 2014 or later. All former residency letter templates and initial interpreting physician qualification requirements are still applicable to the time periods that they were previously used for.
Alternate pathways are available for those who are unable to become board certified (refer to www.FDA.gov for these MQSA regulations).
Women’s Imaging Curriculum based off the ABR Core Exam

1) Regulatory/Standards of Care
   a) Components and desired goals of the medical audit for breast cancer detection
   b) Appropriate application of the Breast Imaging Reporting and Data System (BI-RADS) terminology and assessment categories
   c) Mammography Quality Standards Act (MQSA) requirements
   d) Quality determinants of mammography, breast ultrasound, and breast MR, including positioning, image processing, artifacts, optimal technique, and equipment

2) Screening
   a) Indications
   b) Normal anatomy (mammography, ultrasound, MR)
   c) Lesion detection and localization
   d) Computer-aided detection
   e) Breast cancer risk factors, including the identification and management of women at high risk for breast cancer

3) Diagnostic Breast Imaging
   a) Appropriate mammographic views for work-up of a breast lesion
   b) Evaluate and manage women and men with breast symptoms
      i) Palpable masses
      ii) Breast thickening
      iii) Nipple discharge
      iv) Nipple retraction
      v) Skin changes
   c) Appearance and management of inflammatory processes in the breast
      i) Benign
      ii) Malignant
   d) Role of imaging in surgical staging and surgical planning in women with recently diagnosed breast cancer
   e) Normal and abnormal appearance after surgical procedures
      i) Breast implants
      ii) Breast augmentation
      iii) Breast reduction
      iv) Breast reconstruction
      v) Normal and abnormal appearance of breast-conserving therapy

4) Pathology
   a) Appearance and management of benign breast lesions, high-risk lesions, ductal carcinoma in situ, invasive ductal carcinoma, and other special types of breast carcinoma
   b) Appearance and causes of benign and malignant male breast disease
5) Imaging findings
   a) Characteristics of benign and malignant breast calcifications
   b) Characteristics of benign and malignant breast masses
   c) Identify and appropriately manage imaging findings
      i) Mammography
         (1) Abnormal calcifications
         (2) Masses
         (3) Asymmetries
         (4) Architectural distortion
      ii) Ultrasound
      iii) Breast MR
         (1) Masses
         (2) Non-mass findings
   d) Identify and understand the causes of abnormal lymph nodes
      on mammography, ultrasound, or MRI

6) Breast Intervention
   a) Percutaneous breast biopsy techniques
      i) Wire localization
      ii) Core biopsy
      iii) Vacuum-assisted biopsy
      iv) Fine needle aspiration
      v) Galactography/Ductography
      vi) Cyst aspiration
   b) Specimen radiography
   c) Concordant versus discordant percutaneous biopsy results for
      imaging appearance of a breast abnormality and appropriate
      management
   d) Patient safety

7) Physics
   a) Mechanism of obtaining and optimizing film-screen or digital mammograms
      i) Target/filter combinations
      ii) Use of a grid
      iii) Reduction of scatter
      iv) Radiation dose
   b) Adjustment of mammography techniques for special cases, including thin
      breasts
   c) Mechanism of obtaining and optimizing breast US images
   d) Mechanism of obtaining and optimizing breast MR images
   e) Recognition, understanding, and correction of artifacts in breast
      imaging, including mammography, US, and MR imaging
   f) Workstation display of digital mammograms
      i) Required equipment parameters
      ii) Image processing
Computer-assisted display software for breast MRI, including the role of dynamic enhancement characteristics
By signing this document you are confirming that you have received and reviewed, with your preceptor, the Women’s imaging goals and objectives for this academic year.

This receipt will be kept in your personal file.

Resident Name (please print) ____________________________________________

Resident Signature _______________________________________________

by signing this – you confirm that you have reviewed the G&O with your preceptor

Date ________________________________

Preceptor Signature _______________________________________________

by signing this – you confirm that you have reviewed the G&O with the resident

Date ________________________________