Overall educational goals for the program:

Residents will spend twelve full-time weeks working in breast imaging, and will be expected to develop general competency in all aspects of breast screening and diagnosis. General competency is defined as the ability to interpret screening and diagnostic mammography, breast ultrasound, and breast MRI; to guide clinical colleagues in the correct imaging evaluation of screening patients as well as diagnostic patients with various clinical breast problems; and to have a working knowledge of breast interventional procedures and breast pathologies. The goal of residency training in breast imaging is to be proficient at screening and diagnostic mammography, needle localization procedures, and to develop a working knowledge of breast MRI and core biopsy techniques.

Residents rotate through breast imaging at both Brigham and Women’s Hospital and Dana Farber Cancer Institute. At DFCI, work will involve interpreting screening studies from DFCI’s mobile van, and interpreting diagnostic work. At BWH, duties will involve screening and diagnostic mammography/ultrasound, as well as breast MRI and interventional procedures. Trainees will function as a daily member of the breast imaging service while rotating through the various breast imaging duties that comprise the section’s work. Currently, residents rotate through breast imaging in their first, third and fourth year of residency.

Competency-based goals and objectives for each trainee assignment at each educational level:

Month 1:

Medical Knowledge:

1. Mammography positioning
   a. Recognize technical adequacy of exams
   b. Observe a screening and diagnostic mammogram being performed
2. Basics of Mammography Quality Control
   a. Purpose and frequency of QC tests performed by technologist/physicist
   b. Recognition of artifacts
3. Basic knowledge of requirements for equipment, quality control, and personnel for ACR accreditation and MQSA certification
4. Indications for screening and diagnostic mammography
   a. Screening guidelines
   b. Screening sensitivities, diagnostic specificities
   c. Utilization of additional diagnostic views-magnification, spot compression, specialized views
5. Basic breast ultrasound technique and interpretation
   a. Indications for breast ultrasound
6. Learn BIRADS Lexicon for mammography and breast ultrasound
7. Basic Normal Anatomy
8. Recognize common breast pathologies
9. Learn the primary and secondary signs of malignancy on mammography
10. Learn Needle localization technique and perform a minimum of ten needle localizations over a four week period

Patient Care:

1. Protect Patient confidentiality
2. Apply proper sterile technique during procedures
3. Demonstrate an appropriate, professional and compassionate demeanor toward patients while on diagnostic breast imaging and needle localizations
4. Adhere to institutional patient safety protocols, such as “time outs”

Practice-based learning and improvement:

1. Apply knowledge to new situations
2. Demonstrate initiative in correcting errors in interpretation and reporting
3. Demonstrate application of outside reading to daily practice

Communication and Interpersonal skills:

1. Learn mechanics of IDXRAD
2. Create reports using BIRADS terminology and assessment codes
3. Learn basics of consistent, clear, concise and logical breast reporting and assessment
4. Call referring physician with all positive (BIRADS 4 or 5) results
5. Communicate findings and recommendations effectively to patients

Professionalism:

1. Demonstrate respect for patients and all members of the health care team
2. Respect patient confidentiality
3. Present oneself as a professional in appearance and communication
4. Demonstrate a responsible work ethic with regard to work assignments

Systems-based practice:

1. Understanding of role of breast imaging in the general population
2. Understanding of practice differences for breast imaging between community based and academic based practice
3. Work effectively in various settings within the breast imaging section
4. Able to use hospital-based systems to communicate effectively with other departments for patient care
5. Understanding of hospital-based and MQSA based guidelines in communicating positive breast findings (BIRADS 3, 4, 5) and positive biopsy results
6. Participate in interdisciplinary discussions and conferences with surgery, oncology, and pathology when practicable

Second Month:

Medical Knowledge:
1. Improve screening and diagnostic mammography interpretive skills
   a. Calcification analysis and assessment
   b. Mass analysis and assessment
   c. Develop further understanding of additional mammographic views
   d. Develop an understanding of secondary findings on mammography
   e. Appropriate workup of various clinical problems/symptoms

2. Continue skill development in performing and interpreting breast ultrasound

3. Improve needle localization technique and performance

4. Perform ultrasound guided cyst aspirations
   a. Learn indications for cyst aspiration
   b. Management of fluid

5. Observe stereotactic and ultrasound guided core biopsies, develop understanding of
   indications for core biopsy and benefits of each technique

6. Benign breast lesions and their appearance

7. Breast Cancer Staging
   a. Multifocal, multicentric cancer
   b. Breast Cancer subtypes

8. Other breast malignancies—Lymphoma, metastases, phyllodes

9. High risk pathologies (ADH, Lobular Neoplasia, Papillomas, Radial Sclerosing
   Lesions) on core biopsy, and their management

10. Basic understanding of surgical treatments of breast cancer

11. Epidemiology of breast cancer
   a. Incidence, mortality, risk factors, survival by stage

12. Breast MRI—indications, techniques and sequences, kinetics and morphology

Patient Care:

1. Protect Patient confidentiality
2. Apply proper sterile technique during procedures
3. Demonstrate an appropriate, professional and compassionate demeanor
   toward patients on diagnostic and interventional procedures
4. Adhere to institutional patient safety protocols, such as “time outs”

Practice-based learning and improvement:

1. Apply knowledge to new situations
2. Demonstrate initiative in correcting errors in interpretation and reporting
3. Demonstrate application of outside reading to daily practice

Communication and Interpersonal skills:

1. Appropriate use of BIRADS descriptors and assessment categories
2. Concise and clear reports
3. Correct identification of lesion location
4. Concordance between lesion descriptors and assessments
5. Contact referring physician on all positive examinations (BIRADS 4 and 5), or need
   for additional imaging
6. Communicate effectively with patients

Professionalism:

1. Demonstrate respect for patients and all members of the health care team
2. Respect patient confidentiality
3. Present oneself as a professional in appearance and communication
4. Demonstrate a responsible work ethic with regard to work assignments

**Systems-based practice:**
1. Understanding of role of breast imaging in the general population
2. Understanding of practice differences for breast imaging between community based and academic based practice
3. Work effectively in various settings within the breast imaging section
4. Able to use hospital-based systems to communicate effectively with other departments for patient care
5. Understanding of hospital-based and MQSA based guidelines in communicating positive breast findings (BIRADS 3, 4, 5) and positive biopsy results
6. Participate in interdisciplinary discussions and conferences with surgery, oncology, and pathology when practicable
7. Understanding of population based and individual cost-benefit analysis in managing positive breast imaging findings

**Third Month:**

**Medical Knowledge:**

1. Improve diagnostic and screening skills
2. Improve breast ultrasound skills
3. Develop working knowledge of breast MRI
   a. Indications for breast MRI
   b. BIRADS MRI lexicon
   c. Techniques and sequences
   d. Strengths and limitations of kinetics and morphologic analysis
   e. Recognize normal MRI anatomy
   f. Recognize features of benign and malignant masses
   g. Recognize features of benign and malignant non-mass-like enhancement
   h. Evaluation of implants
   i. Correlation of MRI findings with mammography, breast ultrasound and clinical exam
4. Core biopsy
   a. Develop correct core biopsy technique
   b. Understand the indications and limitations of core biopsy
   c. Radiologic-Pathologic correlation
   d. Management of high risk lesions on core biopsy
5. Medical Audit
   a. Audit Definitions, in BIRADS Manual
   b. Goals and benchmarks for screening and diagnostic mammography
   c. Audit requirements for MQSA, responsibilities of lead interpreting physician

**Patient Care:**

1. Protect Patient confidentiality
2. Apply proper sterile technique during procedures
3. Demonstrate an appropriate, professional and compassionate demeanor toward patients
4. Adhere to institutional patient safety protocols, such as “time outs”

**Practice-based learning and improvement:**
1. Apply knowledge to new situations
2. Demonstrate initiative in correcting errors in interpretation and reporting
3. Demonstrate application of outside reading to daily practice

**Communication and Interpersonal skills:**
1. Appropriate use of BIRADS descriptors and assessment categories
2. Concise and clear reports
3. Correct identification of lesion location
4. Concordance between lesion descriptors and assessments
5. Contact referring physician on all positive examinations (BIRADS 4 and 5), or need for additional imaging
6. Communicate effectively with patients

**Professionalism:**
1. Demonstrate respect for patients and all members of the health care team
2. Respect patient confidentiality
3. Present oneself as a professional in appearance and communication
4. Demonstrate a responsible work ethic with regard to work assignments

**Systems-based practice:**
1. Understanding of role of breast imaging in the general population
2. Understanding of practice differences for breast imaging between community based and academic based practice
3. Work effectively in various settings within the breast imaging section
4. Able to use hospital-based systems to communicate effectively with other departments for patient care
5. Understanding of hospital-based and MQSA based guidelines in communicating positive breast findings (BIRADS 3, 4, 5) and positive biopsy results
6. Participate in interdisciplinary discussions and conferences with surgery, oncology, and pathology when practicable
7. Understanding of population based and individual cost-benefit analysis in managing positive breast imaging findings

**Regularly scheduled didactic educational experiences:**

Didactic sessions covering breast imaging will span a three week block each year, and cover essential breast imaging topics, as well including several case based conferences. In addition, there are three additional case based conferences during the remaining academic year.

**Didactic Lecture Topics:**

Calcifications
Delineation of trainee responsibilities for patient care, progressive responsibility for patient management, and supervision of trainees over the continuum of the program:

In the first month of breast imaging training, residents will be instructed in how to perform needle localizations, directly supervised during the entire procedure from planning, to execution, to review of specimen radiography and interacting with the surgical team. Residents will interpret screening mammograms, diagnostic mammograms and breast ultrasound exams at the side of an attending physician. They will at first observe the attending physician examining and communicating with the patient, then progress to doing so themselves with attending supervision. As they gain competency towards the end of the first month or mid-second month, they will be allowed increasing independence in communicating with, and guiding the patient and referring physician in management of breast findings.

In the second and third months of breast imaging, the resident will be allowed, and expected to display, more independence in assessing breast imaging exams, determining the next course of action, and then presenting their medical plan to the attending physician. They will be given increasing independence in guiding the technologists in the diagnostic evaluation. During interventional procedures, they will at first observe, then start performing procedures with direct supervision. As their skills develop, they will be allowed increasing independence in preparing the patient and performing the procedure. They will continue to be directly supervised during interventional procedures, but attending physicians will increasingly observe the resident, rather than performing the procedure themselves. Upon completion of the third month, residents will be ready to independently interpret screening and diagnostic mammography, perform and interpret breast ultrasound, and have a working knowledge of breast MRI and breast interventional procedures. Residents planning to spend additional elective time in breast imaging over and above their twelve week period will develop additional expertise and experience in breast MRI and breast interventional procedures.