Harlem Hospital Center
Integrated Radiology Residency Program
Mammography
Educational goals and objectives

Rotation 1 – (Radiology year 1/2)

Knowledge Based Objectives: At the end of the rotation, the resident should be able to:

1. Define breast pathology and distinguish benign and malignant lesions.

2. Perceive breast masses, calcifications architectural distortions and other abnormalities on mammograms and determine their probability of malignancy.

3. Know BIRADS classification system. Determine the appropriate management of mammographic abnormalities.

4. Understand difference between screening and diagnostic examinations.

5. For both standard and problem-solving views, describe the technique for the images, the correct terminology and the appropriate uses.


7. Obtain proper clinical and surgical history.

8. Understand the indications, and complications of breast interventional procedures initially observing, procedure such as:
   • Needle Localization with mammographic, stereotactic or ultrasonographic guidance.
   • Cyst aspiration
   • Fine needle aspiration and core needle biopsy with stereotactic or ultrasonographic guidance
   • Galactography
   • MRI guided biopsy


Practice-based learning and improvement:

1. Determine the elements of quality control and quality assurance (discuss the common technical problems that impact on image quality).

2. Submit 1-2 cases to the QA log and discuss with the technologist how to improve upon these cases.
3. Submit two-teaching file cases.

4. Recognize the commonly used mammographic projections and what constitutes proper positioning and technique.

5. Be aware of the demographics of disease prevalence in our patient population. Be aware of what studies are ordered for staging of breast cancer and the clinical indications for ultrasound and MRI.

**System-based practice:**

1. Participate in the mammographic portion of the tumor board.

2. Guide and educate clinicians, technologists, medical students/residents in the proper utilization and indications for mammography vs. ultrasound on a case-by-case basis.

3. Given the disease prevalence in our institution and the patient demographics. Know which cases can be managed with different kinds of interventional procedures.

**Patient care:**

1. In cases where the clinical question is ambiguous, discuss with the clinical teams/consult services on a case-by-case basis to select the proper imaging modality, which will answer the clinical question. As necessary review the laboratory data and prior imaging/surgical and pathology reports.

2. All cases are to be reviewed with the attending and dictated and when necessary the referring clinical services contacted with the pertinent findings in a timely manner.

3. Understand the psychosocial concerns of the patients undergoing Breast imaging work-up and learn how to deal with these issues.

4. Maintain patient safety
   A proper monitoring equipment and clinical services are to accompany the patient. When patient is clinically deteriorating, recruit nursing staff, code team and attending physicians and assess/stabilize the patient.

5. The informed consent process must convey to the patient ample accurate information for the patient to be able to make an informed decision.
Interpersonal and communication skills:

1. As a multicultural institution be mindful of the differences in region, ethnicity and gender as well as educational level which affect how information is conveyed and interpreted/perceived.

2. All patient questions and concerns will be addressed.

3. All interactions and discussions with clinical colleagues, ancillary support staff, technologists and patients will demonstrate mutual respect and compassion.

Professionalism:

1. All interactions and discussions with clinical colleagues, ancillary support staff, technologists and patients will demonstrate mutual respect and compassion.

2. Patient confidentiality will be maintained.

Rotation 2 (Radiology year 2/3)
Knowledge Based Objectives: At the end of the rotation, the resident should be able to:

1. Define breast pathology and the clinical significance of various benign and malignant lesions.

2. Identify and classify breast masses, calcifications, architectural distortions and other abnormalities on mammograms using Birads Lexicon.

3. Determine the appropriate management of mammographic abnormalities. Determine when correlation with ultrasound and MRI are necessary.

4. For both standard and problem-solving views describe the techniques for the images, the correct terminology, and the appropriate uses.

5. Perform breast exam and correlate with problem solving mammography.

6. Understand the indications, and complications of breast interventional procedures initially observing and then performing under the supervision of radiologist. Be familiar with the pre-procedure management of patients.

Procedures such as:

- Needle Localization with mammographic, stereotactic or ultrasonographic guidance.
- Cyst aspiration
- Fine needle and core needle biopsy with Stereotactic or ultrasonographic guidance
- Galactography
- MRI guided biopsy
7. Perform and interpret breast ultrasound examinations. Understand ultrasonographic terminology of breast pathology, which are used to characterize these lesions.

Practice-based learning and improvement:

1. Determine the elements of quality control and quality assurance (discuss the common technical problems that impact on image quality).

2. Observe quality control tests being performed daily at 7:30am everyday by technologist in mammography suite.

3. Observe technologist performing CC(craniocaudal), MLO (mediolateral oblique) views.

4. Recognize the commonly used mammographic projections and what constitutes proper positioning and technique.

5. Submit 1-2 cases to the QA log and discuss with the technologist how to improve upon these cases.

6. Submit two-teaching file cases.

7. Be aware of the demographics of disease prevalence in our patient population. Be aware of what studies are ordered for staging of breast cancer and the clinical indications for ultrasound and MRI.

System-based practice:

1. Participate in the mammographic portion of the tumor board.

2. Guide and educate clinicians, technologists, medical students/residents in the proper utilization and indications for mammography vs. ultrasound on a case-by-case basis.

3. Given the disease prevalence in our institution and the patient. Know which cases can be managed with different kinds of biopsies.

Patient care:

1. In cases where the clinical question is ambiguous, discuss with the clinical teams/consult services on a case-by-case basis to select the proper imaging modality, which will answer the clinical question. As necessary review the laboratory data and prior imaging/surgical and pathology reports.

2. All cases are to be reviewed with the attending and dictated and when necessary the referring clinical services contacted with the pertinent findings in a timely manner.
3. Understand the psychosocial concerns of the patients undergoing Breast imaging work-up and learn how to deal with these issues.

**Maintain patient safety**

4. A proper monitoring equipment and clinical services are to accompany the patient when patient is clinically deteriorating, recruit nursing staff, code team and attending physicians and assess/stabilize the patient.

5. The informed consent process must convey to the patient ample accurate information for the patient to be able to make an informed decision.

**Interpersonal and communication skills:**

1. As a multicultural institution be mindful of the differences in region, ethnicity and gender as well as educational level which affect how information is conveyed and interpreted/perceived.

2. All patient questions and concerns will be addressed.

3. All interactions and discussions with clinical colleagues, ancillary support staff, technologists and patients will demonstrate mutual respect and compassion.

**Professionalism:**

1. All interactions and discussions with clinical colleagues, ancillary support staff; technologists and patients will demonstrate mutual respect and compassion.

2. Patient confidentiality will be maintained.

**Rotation 3, 4 and 5 (Radiology year 3/4)**

**Knowledge Based Objectives: At the end of the rotation, the resident should be able to:**

1. Define breast pathology and the clinical significance of various benign and malignant lesions.

2. Identify and classify breast masses, calcifications, architectural distortions and other abnormalities on mammograms and determine their probability of malignancy.

3. Determine the appropriate management of mammographic abnormalities.

4. For both standard and problem-solving views describe the technique for the images, the correct terminology, and the appropriate uses.

5. Perform breast examinations and correlate with problem solving mammography.

6. Understand the indications, correlation and complications of breast interventional procedures initially observing and then performing under
supervision of radiologist. Perform as many of the procedures as possible. Understand the importance of correlation with pathology and congruence between imaging and pathology results. Understand what pathologies require further surgical management.

Procedures such as:

- Needle localization with mammographic, stereotactic or ultrasonographic guidance.
- Cyst aspiration
- Fine needle and core needle biopsy with stereotactic or ultrasonographic guidance
- Galactography
- MRI guided biopsy

7. Be more familiar with post-operative breast evaluation and evaluation of the breast augmentation(implants).

8. Perform and interpret breast ultrasound examinations. Understand ultrasonographic terminology of breast pathology, which are used to characterize these lesions. Understand proper management of such lesions.

**Practice-based learning and improvement:**

1. Determine the elements of quality control and quality assurance (discuss the common technical problems that impact on image quality).

2. Observe quality control tests being performed daily at 7:30am everyday by technologist, mammography suite.

3. Observe technologist performing nonstandard views. Attempt to perform and obtain standard/nonstandard views under supervision of senior technologist.

4. Recognize the commonly used mammographic projections and what constitutes proper positioning and technique.

5. Submit 1-2 cases to the QA log and discuss with the technologist how to improve upon these cases.

6. Submit two-teaching file cases.

7. Recognize the commonly used mammographic projections and what constitutes proper positioning and technique.

8. Be aware of the demographics of disease prevalence in our patient population. Be aware of what studies are ordered for staging of breast cancer and the clinical indications for ultrasound and MRI.
System-based practice:

1. Attend one of the training courses for Breast Imaging/Interventional Procedures.
2. Participate in the mammographic portion of the tumor board.
3. Guide and educate clinicians, technologists, medical students/residents in the proper utilization and indications for mammography vs. ultrasound on a case-by-case basis.
4. Given the disease prevalence in our institution and the patient demographics. Perform different kinds of biopsies under the supervision of a mammographer.

Patient care:

1. In cases where the clinical question is ambiguous, discuss with the clinical teams/consult services on a case-by-case basis to select the proper imaging modality, which will answer the clinical question. As necessary review the laboratory data and prior imaging/surgical and pathology reports.
2. All cases are to be reviewed with the attending and dictated and when necessary the referring clinical services contacted with the pertinent findings in a timely manner.
3. Understand the psychosocial concerns of the patients undergoing Breast imaging work-up and learn how to deal with these issues.

Maintain patient safety

1. A proper monitoring equipment and clinical services are to accompany the patient when patient is clinically deteriorating, recruit nursing staff, code team and attending physicians and assess/stabilize the patient.
2. The informed consent process must convey to the patient ample accurate information for the patient to be able to make an informed decision.
3. The informed consent process must convey to the patient ample accurate information for the patient to be able to make an informed decision.

Interpersonal and communication skills:

1. As a multicultural institution be mindful of the differences in region, ethnicity and gender as well as educational level which affect how information is conveyed and interpreted/perceived.
2. All patient questions and concerns will be addressed.
3. All interactions and discussions with clinical colleagues, ancillary support staff, technologists and patients will demonstrate mutual respect and compassion.

**Professionalism:**

1. All interactions and discussions with clinical colleagues, ancillary support staff; technologists and patients will demonstrate mutual respect and compassion.

2. Patient confidentiality will be maintained.

**Required reading:**

1. Debra M Ikeda “Breast Imaging. The Requisites” 2004
2. Gilda Caldernosa “Breast Imaging The Core Curriculum” and “Breast Imaging Companion” book
3. Kopans “Breast Imaging”
6. Electronic resourses such as Amirysis and others.
7. ACR BIRADS Atlas, available in the mammography suite.
CURRICULUM

1) Introduction: What is Women’s Imaging
2) Malignant tumors of the breast
3) Mammographic appearance of the breast masses
4) Sonographic appearance of the breast masses
5) Breast calcifications, imaging and management strategy
6) BIRADS lexicon for mammography and breast ultrasound
7) Current role of MRI in breast Imaging. BIRADS lexicon for breast MRI
8) Interventional procedures in the breast imaging
9) Diagnostic strategy and management in the breast imaging
10) Neoplastic conditions in the female pelvis.
11) Inflammatory and congenital conditions of the female pelvis.
13) First trimester pregnancy ultrasound
14) Second trimester pregnancy ultrasound
15) Third trimester pregnancy ultrasound
16) Pelvic and fetal MRI
17) Adrenals and hypophysis in Women’s Imaging
18) Bone densitometry

Curriculum augmented by Columbia Lectures