**Four Day Mammography Training**

Two options to choose from:

*March 19 – 22 or July 30 – August 2*

**Day 1 (7 hours)**

8:00 – 11:00 NCRC Testing if you have not completed prior to \_\_\_\_\_\_\_\_\_\_ at a career center near you

11:00 – 12:00 Lunch on your own

12:00 – 1:00 History of Mammography (1 hour)

Objectives:
Student will have the ability to:

* Discuss the growth/evolution of mammography
* Identify and discuss early mammography practices that are no longer in use
* Appreciate the connection between scientific advances from technology and biology that make mammography what it is today

1:00 – 2:00 Background Information and the Need for Screening (1 hour)

 Objectives:
 Student will have the ability to:

* Relate an increased risk for breast cancer to aging
* Explain the benefits from early detection of a cancer as critical to treatment
* Compare stages of cancer development to levels of mortality
* Discuss the economics of misdiagnosing a breast cancer

2:00 – 2:10 Break

2:10 – 3:05 Patient Considerations (1 hour)

 Objectives:
 Student will have the ability to:

* Understand the patient’s emotional needs and responses throughout the breast imaging process
* Develop skills to provide emotional comfort, support, and relief to the patient

3:05 – 4:00 Breast Anatomy and Physiology (2 hours)

Objectives:
 Student will have the ability to:

* Link the external landmarks of the breast with the internal structures
* Delineate the internal composition of the breast and match tissue types to their radiographic appearance
* Identify the internal and external changes to the breast as women age

4:00 – 4:15 Break

4:15 – 5:15 Breast Anatomy and Physiology (continued) – Objectives listed above

5:15 – 7:15 Mammographic Pathology (2 hours)

 Objectives:
 Student will have the ability to:

* Describe the pathologist’s contributions to a diagnosis when a biopsy is requested
* Identify external conditions of the breast that will be reported to the radiologist
* Compare and contrast the radiographic appearance of benign disease processes and malignant disease processes

**Day 2 (8 hours)**

8:00 – 10:55 Mammographic Positioning (3 hours)

 Objectives:
 Student will have the ability to:

* Compare and contrast the basic positions, projections, and techniques used for mammography and how they are accomplished
* Discuss basic procedures and recognized standards involved with breast imaging

10:50 – 11:05 Break

11:05 – 12:00 Thinking in Three Dimensions (1 hour)

 Objectives:
 Student will have the ability to:

* Utilize descriptive terminology used to describe lesion location within the breast
* Determine location of lesions within the breast base on the location of the lesion of the mammogram
* Determine location of lesions within the breast when the lesion is seen on only one standard mammographic view.

12:00 – 1:00 Lunch on your own

1:00 – 2:00 Analog Mammography Machines, Processors, and Films (1 hour)

 Objectives:
 Student will have the ability to:

* Discuss the various components of the mammography machine, the purpose and function of each
* Describe the special features and benefits for didactic mammography x-ray tube designs
* Discuss the design and rational for single emulsion film used in mammography
* List the procedures and environmental controls for optimal processing of single emulsion film

2:00 – 2:55 Darkroom and Processing Considerations in Mammography (1 hour)

 Objectives:
 Student will have the ability to:

* Discuss the importance of processing within the imaging chain
* Discuss common artifacts found of film/screen mammograms
* Describe the basic elements within the darkroom that affect image quality

2:55 – 3:05 Break

3:05 – 5:00 Quality Assurance in Film/Screen Mammography (2 hours)

 Objectives:
 Student will have the ability to:

* Discuss the purpose and benefits of a quality assurance (QA) program
* Understand the regulatory compliance involved with mammographic imaging
* Discuss the responsibilities of the mammography technologist, radiologist, and medical physicist in a QA program
* Describe the medical outcomes audit required by MQSA regulations

**Day 3 (8 hours)**

8:00 – 9:00 End of the Road for Analog Mammography? (1 hour)

 Objectives:
 Student will have the ability to:

* List the key factors that made mammography the last x-ray procedure to convert to digital imaging
* Compare and contrast the advantages/disadvantages of analog versus digital mammography
* Explain the impact the ACRIN/DMIST study had on the acceptance of digital technology for mammography

9:00 – 9:55 Creating the Digital Image (2 hours)

 Objectives:
 Student will have the ability to:

* Discuss digital image is creation and processing
* Sequence the steps of image production and evaluation of the digital image
* Explain post-processing features available to the radiologist at the review station
* Discuss three methods of digital image production
* Describe the components of a digital mammography system

9:55 – 10:05 Break

10:05 – 11:00 Creating the Digital Image (continued) Objectives listed above

11:00 – 12:00 Digital Integration and Workflow in Mammography (1 hour)

 Objectives:
 Student will have the ability to:

* Describe the unique requirements of mammography within a digital radiology department
* Discuss efficient workflow within the digital mammography environment
* Discuss the process and issues involved with the transition from film/screen imaging to digital imaging for mammography

12:00 – 1:00 Lunch on your own

1:00 – 2:00 Quality Assurance for Full Field Digital Mammography (1 hour)

 Objectives:
 Student will have the ability to:

* Compare and contrast commonalities and differences between quality assurance for a film/screen mammography unit and full field digital mammography (FFDM) unit
* Discuss testing variation between different FFDM manufacturers

2:00 – 2:55 Imaging Components of the FFDM Network (1 hour)

 Objectives:
 Student will have the ability to:

* Discuss additional networking and hardware components needed before any digital mammography imaging can be performed
* Understand terminology used to describe the systems and requirements of those components

2:55 – 3:05 Break

3:05 – 5:00 Breast Cancer Diagnostic Technologies: Today and Tomorrow (2 hours)

Objectives:
 Student will have the ability to:

* Describe adjunctive technologies currently available and others in various stages of development
* Discuss their potential benefits and limitations
* Discuss the meaning of FDA approval and how it is obtained

**Day 4 (6 hours)**

8:00 – 9:00 Diagnostic Procedures (1 hour)

 Objectives:
 Student will have the ability to:

* Discuss the procedure for preoperative wire-localization and specimen radiography
* Explain the procedure and identify specialized equipment used in cyst aspiration and pneumocystography
* Describe the ductography procedure and its mammographic presentation

9:00 – 9:55 The Nonconforming Patient (1 hour)

Objectives:
 Student will have the ability to:

* Describe typical anatomical breast noncomformities
* Discuss positioning variations that will resolve issues of poor positioning in these patients

9:55 – 10:05 Break

10:05 – 11:00 Practical Application in Problem Solving (1 hour)

 Objectives:
 Student will have the ability to:

* Describe the steps necessary to establish a protocol for working with abnormalities found in the mammogram or physical examination
* Explain changes seen in the mammographic image due to surgical and therapeutic alterations
* Discuss the more common breast surgeries and how to best image these patients

11:00 – 12:00 Minimally Invasive Needle Breast Biopsy (1 hour)

 Objectives:
 Student will have the ability to:

* Define needle gauge, stroke margin, stereo pair, and biopsy
* Discuss the principles of stereotactic biopsy
* Compare and contrast needle core biopsy and vacuum-assisted biopsy
* List the parts and describe the process for using a biopsy instrument

12:00 – 1:00 Lunch on your own

1:00 – 2:00 Breast MR (1 hour)

 Objectives:
 Student will have the ability to:

* Discuss common medical conditions for referring a patient for breast MR services
* Explain safety precautions for the magnet and the patient

2:00 – 3:00 Breast Cancer Treatments (1 hour)

 Objectives:
 Student will have the ability to:

* Explain the significance of lymph node sampling
* Discuss why axillary node dissection versus sentinel lymph node would be an appropriate choice
* Discuss the differences between chemotherapy and hormone therapy
* Explain the various breast reconstruction options available
* Describe conditions when external radiation therapy versus brachytherapy would be an appropriate choice

3:00 – 5:00 Hands on Positioning (2 hours)

*This workforce solution was funded by a grant awarded by the U.S. Department of Labor’s Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.*



This work is licensed under the Creative Commons Attribution 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>.