

DMS-2450: BREAST SONOGRAPHY

Cuyahoga Community College

Viewing: DMS-2450 : Breast Sonography

Board of Trustees:

March 2020

Academic Term:

Fall 2020

Subject Code

DMS - Diagnostic Medical Sonography

Course Number:

2450

Title:

Breast Sonography

Catalog Description:

In-depth study of breast sonography. Study of breast anatomy and physiology as it pertains to medical ultrasound. Detailed discussion of breast pathologies, anatomic variants, benign and malignant lesions, and their anatomic variants, benign and malignant lesions, and their sonographic appearances. Overview of related breast imaging modalities, breast surgical procedures, and breast pathology treatments.

Credit Hour(s):

2

Lecture Hour(s):

2

Requisites

Prerequisite and Corequisite

DMS-1950 Field Experience II or departmental approval.

Outcomes

Course Outcome(s):

Examine and interpret factors associated with a breast ultrasound exam to include normal, abnormal, and diseased anatomy and physiology.

Objective(s):

1. Provide a detailed description of the normal and abnormal anatomy and physiology of the breast and its sonographic appearance.
2. Identify the sonographic characteristics, signs and symptoms, and diagnosis of benign and malignant breast pathology.
3. Outline an ultrasound breast exam set up, indications, physical breast exam, and patient history.
4. Describe the standard exam protocols for performing breast sonography.
5. Apply principals of ultrasound physics for optimization of the breast ultrasound exam.

Course Outcome(s):

State the value of various related breast procedures

Objective(s):

1. Correlate mammography and other diagnostic breast procedures to the ultrasound breast exam.
 2. Compare invasive breast procedures as to their advantages and disadvantages.
-

Methods of Evaluation:

1. Test and quizzes
2. Midterm final exam

3. Research paper/project
4. Online discussions
5. Worksheets

Course Content Outline:

1. Concepts
 - a. Exam scanning protocols
 - b. Anatomic structures of the breast
 - c. Normal and abnormal physiology of the breast
 - d. Breast pathology sonographic appearances
 - e. Breast imaging modalities
 - f. Breast surgical procedures
 - g. Breast cancer risk factors
2. Skills
 - a. Correlate patient history and physical findings to the breast sonography exam
 - b. Use critical thinking to determine normal verses abnormal
 - c. Correlate the breast ultrasound exam to other related breast imaging procedures.
3. Issues
 - a. Knowledge application
 - b. Problem solving
 - c. Medical ethics
 - d. Patient communication

TOPICAL OUTLINE

1. Normal anatomy
 - a. Ducts
 - b. Fibroglandular tissue
 - c. Fat
 - d. Skin
 - e. Coopers ligaments
 - f. Muscle
 - g. Fascia
 - h. Ribs
 - i. Nipple
 - j. Vascularity
 - k. Lymphatic
 - l. Normal breast ultrasound appearance
2. Breast development and changes
 - a. Embryologic and post pubescent development
 - b. Pregnancy changes
 - c. Involutional changes
 - d. Physiological change and function
 - e. Physiology and function
 - f. Fibrous changes
 - g. Breast anomalies
 - h. Lactating breast
3. Breast pathologies and conditions
 - a. Benign Conditions and Sonographic Features
 - i. Cyst
 - ii. Galactocele
 - iii. Sebaceous cyst
 - iv. Fibroadenoma
 - v. Papilloma
 - vi. Lipoma
 - vii. Hamartoma
 - viii. Abscess and inflammation
 - ix. Traumatic changes
 - x. Fat necrosis
 - xi. Ductal ectasia

- xii. Edema
- xiii. Diabetic mastitis
- xiv. Pseudoangiomatous hyperplasia
- xv. Phyllodes
- xvi. Radial scar
- xvii. Gynecomastia
- b. Malignant Conditions and Sonographic Features
 - i. Ductal carcinoma in situ (DCIS)
 - ii. Invasive ductal carcinoma
 - iii. Invasive lobular carcinoma
 - iv. Medullary carcinoma
 - v. Mucinous (colloid) carcinoma
 - vi. Inflammatory carcinoma
 - vii. Phyllodes
 - viii. Lymphoma
 - ix. Metastasis
 - x. Lymph nodes
 - xi. Papillary carcinoma
 - xii. Paget's disease
- 4. Patient communication, education and assessment
 - a. Accreditation of personnel and facility
 - b. Explanation of procedure
 - c. Breast cancer statistics
 - d. Breast cancer risk factors, signs and symptoms
 - e. Physical exams
 - i. BSE – Breast Self Exam
 - ii. CBE – Clinical Breast Exam
 - f. Patient history
 - g. Indications/contraindications
 - h. American Cancer Society guidelines
 - i. Bi-Rads
- 5. Breast instrumentation and technique
 - a. Image optimization
 - i. Transducers selection
 - ii. Focal zone
 - iii. Doppler color and power
 - iv. Artifacts
 - v. Standoff pad
 - b. Scan planes and protocols
 - c. Positioning
 - d. Annotation
 - e. Compressibility
 - f. Echo palpation
- 6. Mammographic correlation
 - a. View selection
 - b. Triangulation
 - c. Sonographic vs. mammographic appearance
 - d. Digital mammography
- 7. Other diagnostic breast procedures and correlations
 - a. Ductography
 - b. CT – Computerized Tomography
 - c. MRI – Magnetic Resonance Imaging
 - d. Sentinel node
 - e. Histology of breast tissue
 - f. Scintimammography
 - g. Elastography
- 8. Invasive procedures

- a. Needle Localizations
 - b. Core biopsy
 - c. FNA – Fine Needle Aspiration
 - d. Mammotomy
 - e. ABBI – Advanced Breast Biopsy Instrumentation
 - f. Cyst aspiration
 - g. Abscess drainage
 - h. Breast specimen imaging
 - i. Stereotactic procedure
 - j. Tram flap
 - k. Mastectomy
 - l. Clip placement
 - m. Sterile technique
 - n. Post procedural care
9. Other imaging considerations
- a. Breast implants
 - b. Breast reduction
 - c. Hormone therapy
 - d. Neo-adjuvant chemotherapy
 - e. Post radiation changes
 - f. Post mastectomy reconstruction
 - g. Male breast
 - h. 3D/4D imaging
 - i. Elastography

Resources

Cardenosa, Gilda. *Clinical Breast Imaging: The Essentials*. Philadelphia: Wolters Kluwer, 2015.

Edelman, Sidney K. *Understanding Ultrasound Physics*. 4th. Woodlands: ESP INC, 2012.

Stavros, A.Thomas. *Breast Ultrasound*. 2nd. Philadelphia: Lippincott Williams and Wilkins, 2019.

Sencha, Alexander N. and Elena V. Evseeva. *Breast Ultrasound*. New York: Springer, 2013.

Shah, Biren A. and Sabala Mandava. *Breast Imaging: A Core Review*. Philadelphia, PA: Wolters Kluwer, 2014.

Carr-Hoefer, Catherine. *Breast Ultrasound: A Comprehensive Sonographer's Guide*. Forney, TX: Pegasus Lectures, Inc, 2003.

Gill, Kathryn A. *Breast Sonography Review*. Pasadena, CA: Davies Publishing Inc., 2017.

Top of page

Key: 1472