RADT-2620: ANATOMY AND PATHOLOGY OF THE BREAST

Cuyahoga Community College

Viewing: RADT-2620: Anatomy and Pathology of the Breast

Board of Trustees:
March 2019

Academic Term:
Fall 2019

Subject Code
RADT - Radiography

Course Number:
2620

Title:
Anatomy and Pathology of the Breast

Catalog Description:
Anatomy, physiology and pathology of the breast, including benign and malignant conditions, stages of breast cancer and treatment options.

Credit Hour(s):
1

Lecture Hour(s):
1

Requisites

Prerequisite and Corequisite
Departmental approval: admission to Mammography program.

I. ACADEMIC CREDIT

Academic Credit According to the Ohio Department of Higher Education, one (1) semester hour of college credit will be awarded for each lecture hour. Students will be expected to work on out-of-class assignments on a regular basis which, over the length of the course, would normally average two hours of out-of-class study for each hour of formal class activity. For laboratory hours, one (1) credit shall be awarded for a minimum of three laboratory hours in a standard week for which little or no out-of-class study is required since three hours will be in the lab (i.e. Laboratory 03 hours). Whereas, one (1) credit shall be awarded for a minimum of two laboratory hours in a standard week, if supplemented by out-of-class assignments which would normally average one hour of out-of-class study preparing for or following up the laboratory experience (i.e. Laboratory 02 hours). Credit is also awarded for other hours such as directed practice, practicum, cooperative work experience, and field experience. The number of hours required to receive credit is listed under Other Hours on the syllabus. The number of credit hours for lecture, lab and other hours are listed at the beginning of the syllabus. Make sure you can prioritize your time accordingly. Proper planning, prioritization and dedication will enhance your success in this course.

The standard expectation for an online course is that you will spend 3 hours per week for each credit hour.

Courses offered in other part of terms (e.g. 14 week, 8 week, flexibly scheduled, etc.) ensure equivalent workloads. Students should prioritize their time accordingly, particularly when taking part of term courses.

II. ACCESSIBILITY STATEMENT

Tri-C is committed to providing online services, software, and electronic information that is accessible and usable by all of our students, including those with disabilities. It is our mission to provide accessible opportunities and services by complying with Federal and State accessibility guidelines.

If you need any special course adaptations or accommodations because of a documented disability, please contact Student Accessibility Services (SAS) (https://www.tri-c.edu/student-accessibility-services) or SAS via email at CCCSAS@TRI-C.EDU. Students have the right to request accommodations at any point in the semester, however, accommodations are not retroactive.

Eastern (216) 987-2052 - Voice. (216) 987-2423 - Fax
All students must adhere to the following general guidelines, until further notice:

- Your Tri-C email and visit tri-c.edu/coronavirus regularly for updates.
- Public health requirements and standards are changing rapidly, and the College is adapting its guidance accordingly. Please check pandemic documents.

Students are responsible for adhering to all College health and safety guidance, including that which relates to the COVID-19 pandemic.

Therefore, attendance is recorded in the following ways:

- For in-person and blended-learning courses, students are required to attend the course by the 15th day of the semester (or equivalent for terms shorter than five weeks) to be considered attending. Students who have not met all attendance requirements for in-person and blended courses, as described herein, within the first two weeks or equivalent, will be considered not attending.
- For online courses, students are required to login at least two times per week and submit one assignment per week for the first two weeks of the semester, or equivalent to the 15th day of the term. Students who have not met all attendance requirements for online courses, as described herein, within the first two weeks or equivalent, will be considered not attending.

At the conclusion of the first two weeks of a semester or equivalent, instructors report any registered students who have “Never Attended” a course. Those students will be administratively withdrawn from that course. However, after the time period in the previous paragraphs, if a student stops attending a class or wants or needs to withdraw, for any reason, it is the student’s responsibility to take action to withdraw from the course. Students must complete and submit the appropriate Tri-C form by the established withdrawal deadline.

Tri-C is required to ensure that students receive financial aid only for courses that they attend and complete. Students reported for not attending at least one of their registered courses will have all financial aid funds held until confirmation of attendance in registered courses has been verified. Students who fail to complete at least one course may be required to repay all or a portion of their federal financial aid funds and may be ineligible to receive future federal financial aid awards. Students who withdraw from classes prior to completing more than 60 percent of their enrolled class time may be subject to the required federal refund policy.

If illness or emergency should necessitate a brief absence from class, students should confer with instructors upon their return.

Students having problems with coursework due to a prolonged absence should confer with the instructor or a counselor.

Occasionally, in addition to submitting assignments to their instructors for evaluation and a grade, students will also be asked to submit completed assignments, called ‘artifacts,’ for assessment of course and program outcomes and the College’s Essential Learning Outcomes (ELOs). The artifacts will be submitted in Blackboard or a similar technology. The level of mastery of the outcome demonstrated by the artifact DOES NOT affect the student’s grade or academic record in any way. However, some instructors require that students submit their artifact before receiving their final grade. Some artifacts will be randomly selected for assessment, which will help determine improvements and support needed to further student success. If you have any questions, please feel free to speak with your instructor or contact the Learning Outcomes Assessment office.

College policy prohibits the possession of weapons on college property by students, faculty and staff, unless specifically approved in advance as a job-related requirement (i.e., Tri-C campus police officers) or, in accordance with Ohio law, secured in a parked vehicle in a designated parking area only by an individual in possession of a valid conceal carry permit.

As a Tri-C student, your behavior on campus must comply with the student code of conduct which is available on page 29 within the Tri-C student handbook, available at http://www.tri-c.edu/student-resources/documents/studenthandbook.pdf. You must also comply with the College’s Zero Tolerance for Violence on College Property available at http://www.tri-c.edu/policies-and-procedures/documents/3354-1-20-10-zero-tolerance-for-violence-policy.pdf.

Students are responsible for adhering to all College health and safety guidance, including that which relates to the COVID-19 pandemic.

Public health requirements and standards are changing rapidly, and the College is adapting its guidance accordingly. Please check your Tri-C email and visit tri-c.edu/coronavirus regularly for updates.

All students must adhere to the following general guidelines, until further notice:
• Remain at home if you are ill or experiencing symptoms of illness. Do not attend any in-person class or gathering.
• Notify your instructor(s) if you are ill, have tested positive for COVID-19, or were exposed to an individual who has tested positive for COVID-19 and they will report the information to the Tri-C Compliance & Risk Management team and you may be contacted for follow-up information.
• Wear a mask or face covering at all times, including, but not limited to: upon entering and exiting any Tri-C facility, in class, and in all common areas.
• Maintain a distance of at least six feet between yourself and others at all times and if you must pass near an individual do it quickly and do not linger.
• Provide the College with relevant information about your current health status and participate in any required on-site checks (e.g., temperature checks, current contact information, symptom profile, etc.).
• Use only designated areas of Tri-C facilities, including entrances and exits. Sign in and out of Tri-C facilities as directed.

The general guidelines listed above do not encompass all coronavirus-related guidance. These guidelines are subject to change at the discretion of the College and under the direction of public health authorities. Students who fail to adhere to this guidance may be subject to disciplinary action under the College’s Student Code of Conduct and the Student Judicial Code.

Outcomes
Course Outcome(s):
Describe breast anatomy and structure.

Essential Learning Outcome Mapping:
Not Applicable: No Essential Learning Outcomes mapped. This course does not require application-level assignments that demonstrate mastery in any of the Essential Learning Outcomes.

Objective(s):
1. Identify breast anatomy and physiology internally and externally
2. Discuss the factors and physiologic changes that will affect breast tissue composition.
3. Identify physical changes in the breast.
4. Describe breast structure, developmental stages and the differences between the male and the female breast.
5. Identify and label the breakdown of a single lobe of the breast.
6. Identify the three arterial branches supplying the breast and the three venous drainage channels.
7. Describe the lymphatic system and lymphatic drainage.

Course Outcome(s):
Describe the importance of clinical and self breast examinations and mammograms.

Essential Learning Outcome Mapping:
Not Applicable: No Essential Learning Outcomes mapped. This course does not require application-level assignments that demonstrate mastery in any of the Essential Learning Outcomes.

Objective(s):
1. Compare and contrast clinical and self-breast examinations and explain current evidence-based data regarding each practice.
2. Identify the significance of breast cancer detection through patient screening and diagnostic mammograms.
3. Explain the components and importance of a correlative physical breast assessment.
4. Correlate clinical breast changes with imaging findings and comparison with previous mammograms.
5. Identify and label mammographic anatomical structures when presented with a mammographic image.
6. Correlate breast anatomical structures to mammographic anatomical structures.

Course Outcome(s):
Explore breast pathologies, detection and diagnosis.

Essential Learning Outcome Mapping:
Not Applicable: No Essential Learning Outcomes mapped. This course does not require application-level assignments that demonstrate mastery in any of the Essential Learning Outcomes.

Objective(s):
1. Identify the mammographic appearance of pathologies.
2. Describe the etiology, mammographic appearance, diagnosis and treatment of benign breast pathologies.
3. Describe the etiology, mammographic appearance, diagnosis and treatment of malignant breast pathologies.
Course Outcome(s):
Identify breast cancer risks, treatment and staging.

Essential Learning Outcome Mapping:
Not Applicable: No Essential Learning Outcomes mapped. This course does not require application-level assignments that demonstrate mastery in any of the Essential Learning Outcomes.

Objective(s):
1. Identify the high and low risk factors limited to breast cancer.
2. Describe assessment categories and the recommended clinical follow up.
3. Describe treatment options for breast cancer.
4. Explain breast cancer stages 0 to IV and stage characteristics.
5. Explain tumor node metastasis (TNM) classifications of breast cancer.

Methods of Evaluation:
1. Participation and discussion
2. Written assignments
3. Case studies
4. Exams
5. Quizzes
6. Other methods deemed appropriate by department

Course Content Outline:
1. Definition of the Breast
   a. Male vs. female
   b. Developmental stages
      i. Fetal
      ii. Puberty
      iii. Menstruation
      iv. Pregnancy
      v. Lactation
      vi. Menopause
      vii. Post-menopause
   c. Breast landmarks
      i. Quadrants
      ii. Clock face references
      iii. Region references

2. Gross Anatomy of the Normal Breast
   a. External anatomy
      i. Nipple
      ii. Areola
         1. Montgomery's glands
         2. Morgagni's tubercles
      iii. Skin
         1. Sebaceous glands
         2. Sweat (sudiferous) glands
         3. Hair follicles
      iv. Axillary tail
      v. Breast margins
         1. Superior-inferior
            a. Inframammary fold
         2. Axillary-medial
   b. Internal anatomy
      i. Fascial layers
      ii. Retromammary (fat) space
      iii. Breast parenchymal components
         1. Fibrous tissues
         2. Glandular (secretory) tissues
a. Glandular lobes  
   i. Lobules  
   ii. Terminal ductal lobular unit (TDLU)  
3. Adipose (fatty) tissues  
4. Connective and support stroma  
   a. Cooper's ligaments  
   b. Extralobular/intralobular stroma  
5. Lymphatic channels and drainage from the breast  
6. Circulatory (blood supply) system  
   a. Arteries  
   b. Veins  
iv. Pectoral muscle  
   1. Location  
   2. Relevance  
v. Histology of the breast  
   1. TDLU  
      a. Extralobular terminal duct  
      b. Intralobular terminal duct  
      c. Ductal sinus (acinus)  
   2. Cellular components  
      a. Epithelial cells  
      b. Myoepithelial cells  
      c. Basement membrane  
3. Mammographic Appearance of Breast Anatomy  
   a. External anatomy  
   b. Internal anatomy  
      i. Variances  
      ii. Life cycle changes  
4. Breast Anomolies  
   a. Asymmetry  
   b. Inverted nipples  
   c. Accessory nipples  
   d. Accessory breast tissue  
   e. Other (e.g. congenital)  
5. Clinical Breast Changes (size, location, duration)  
   a. Lumps  
      i. Pain  
      ii. Mobility  
      iii. Other associated indications (e.g. trauma, fever, antibiotics)  
   b. Thickening  
   c. Swelling  
   d. Dimpling  
   e. Skin irritation and lesions (e.g. moles, keratosis, cysts, ulcers, blisters, scaling)  
   f. Pain  
      i. New onset  
   g. Discharge  
      i. New onset  
      ii. Color of discharge  
      iii. Ipsilateral or bilateral  
      iv. Single duct or multiple ducts  
      v. Spontaneous vs. expressed  
   h. Nipple retraction, inversion and areolar changes  
      i. New onset  
   i. Edema  
   j. Erythema  
   k. Mammoplasty  
      i. Breast Augmentation  
         1. Types  
            a. Silicone  
            b. Saline
2. Location
   a. Subglandular
   b. Subpectoral
   ii. Breast lift
   iii. Breast reduction
   iv. Other
i. Reconstructive surgery
   i. Autologous (e.g. TRAM flap, DIEP flap, latissimus dorsi flap)
   ii. Tissue expander
   iii. Implant
   iv. Other
m. Postsurgical excision
n. Radiation changes
o. Other

6. Correlative Physical Breast Assessment
a. Breast examination findings reported by patient or physician
   i. Normal breast examination features
      1. Consistent features
      2. Variations in parenchyma
      3. Fibrocystic changes
   ii. Characteristics of abnormal findings
      1. Redness
      2. Infection
         a. Antibiotic treatment
      3. Abscess
      4. Nipple discharge
      5. Mass
      6. Breast pain
         a. New onset
      7. Skin findings
      8. Nipple findings
      9. Previous surgeries
b. When to perform
c. Visual inspection
d. Palpation techniques
e. Documentation of findings
   i. In reference to breast landmarks
   ii. Clock face description
   iii. Accuracy of measurements
f. Radiopaque marking devices (e.g. palpable vs. skin lesions)
g. Mammographic correlation

7. Mammographic Appearance of Pathology (definition, location)
a. Masses
   i. Margins
      1. Circumscribed
      2. Ill-defined (indistinct)
      3. Lobulated
      4. Spiculated
   ii. Asymmetric density
   iii. Focal asymmetry
   iv. Calcifications
      1. Dermal
      2. Internal
      3. Causes
         a. Cystic changes
         b. Sutural
         c. Vascular
         d. Malignancy
      4. Characteristics
a. Number (quantity)
b. Size
c. Shape
d. Distribution
   i. Clustered or grouped
   ii. Segmental
   iii. Regional
   iv. Diffuse (scattered)
   v. Multiple groups
   vi. Margins
e. Benign characteristics (typical)
   i. Coarse
   ii. Rim or eggshell
   iii. Milk of calcium (teacup-like)
   iv. Dystrophic
   v. Vascular
   vi. Skin (superficial)
   vii. Secretory
   viii. Fat necrosis
   ix. Punctate
f. Suspicious morphology (nondeterminate characteristics)
   i. Indistinct (amorphous)
   ii. Pleomorphic, glanular (clustered)
   iii. Irregular
   iv. Linear
   v. Casting

8. Reporting Terminology (e.g. BI-RADS)
   a. Assessment categories
   b. Recommendations

9. Benign Breast Pathology
   a. Etiology, mammographic appearance, diagnosis and treatment
      i. Cyst
      ii. Galactocele
      iii. Fibroadenoma
      iv. Lipoma
      v. Hamartoma (fibroadenolipomaj)
      vi. Papilloma
      vii. Ductal ectasia
      viii. Breast infection/abcess
      ix. Hematoma
      x. Fat necrosis
      xi. Radial scar
      xii. Lymph node
      xiii. Gynecomastia

10. High Risk Breast Pathology
    a. Etiology, mammographic appearance, diagnosis and treatment
       i. Atypical ductal hyperplasia
       ii. Papilloma with atypia
       iii. Papillomatosis
       iv. Atypical lobular hyperplasia
       v. Lobular carcinoma in-situ
       vi. Phyllodes tumor

11. Malignant Breast Pathology
    a. Etiology, mammographic appearance, diagnosis and treatment
       i. Ductal carcinoma in-situ
       ii. Invasive/infiltrating ductal carcinoma
       iii. Invasive lobular carcinoma
       iv. Pagets disease
v. Sarcoma
vi. Tubular
vii. Medullary
viii. Mucinous
ix. Papillary
x. Metastatic carcinoma

12. Breast Cancer Classifications
a. Stage Characteristics
   i. Description
      1. Size
      2. Invasive vs. noninvasive
      3. Lymph node involvement
      4. Spread beyond the breast
   ii. Stages
      1. Stage 0
      2. Stage I
      3. Stage II
      4. Stage III
      5. Stage IV
b. TNM classification characteristics
   i. TNM description
      1. Size
      2. Lymph node involvement
      3. Metastasis
   ii. T-size
      1. TX
      2. T0
      3. Tis
      4. T1, T2, T3, T4
   iii. N-lymph node involvement
      1. NX
      2. N0
      3. N1, N2, N3
   iv. M-metastasis
      1. MX
      2. M0
      3. M1
c. Cell grade
   i. Definition
   ii. Grade 1
   iii. Grade 2
   iv. Grade 3
d. Multifocal
e. Multicentric
f. Hormone receptors and HER2
   i. Importance of tests
   ii. Estrogen
   iii. Progesterone
   iv. HER2

13. Hormonal Influences
a. Birth control pills
b. Estrogen
c. Progesterone
d. Prolactin
e. Testosterone
f. Other
**Resources**


**Resources Other**


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