

MAMMOLAND

One Brooklyn Health

2025

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Director of Education, Mammography Educators



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Question 1

Which part of the breast is glandular breast tissue

- a. Ducts, lobes, lobules, acini
- b. Nipple, Coopers ligaments and Montgomery tubercles
- c. IMF, retromammary fat, axilla, nipple
- d. All of the above



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Question 1

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Something to Keep in Mind

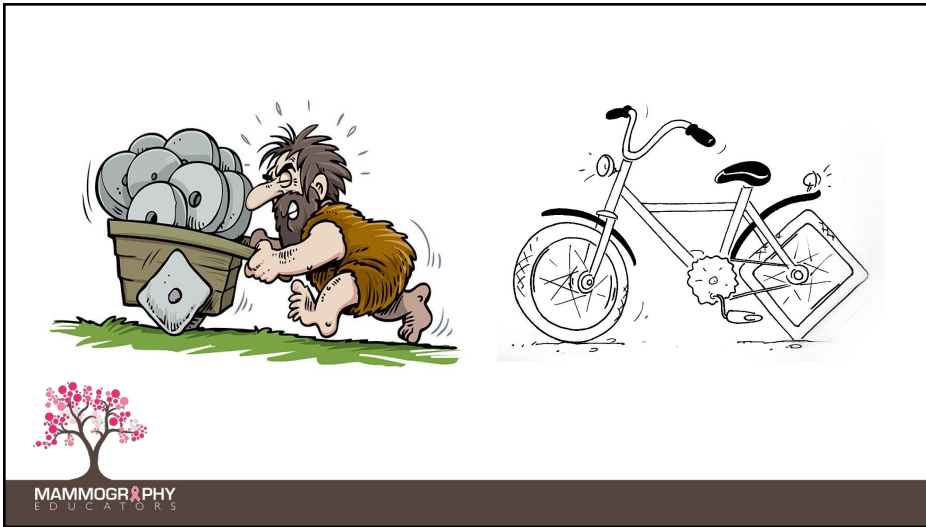
Form Follows Function

The shape (form) of something is designed to facilitate what they do.



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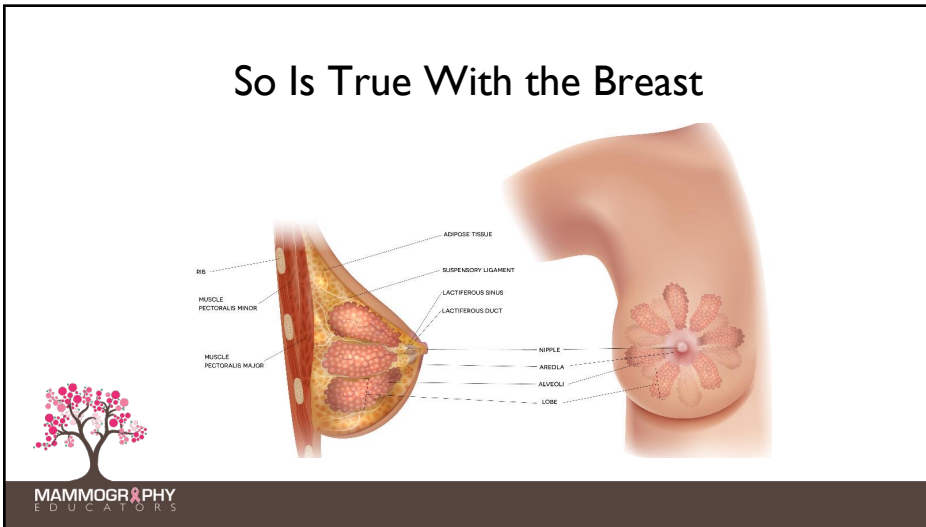
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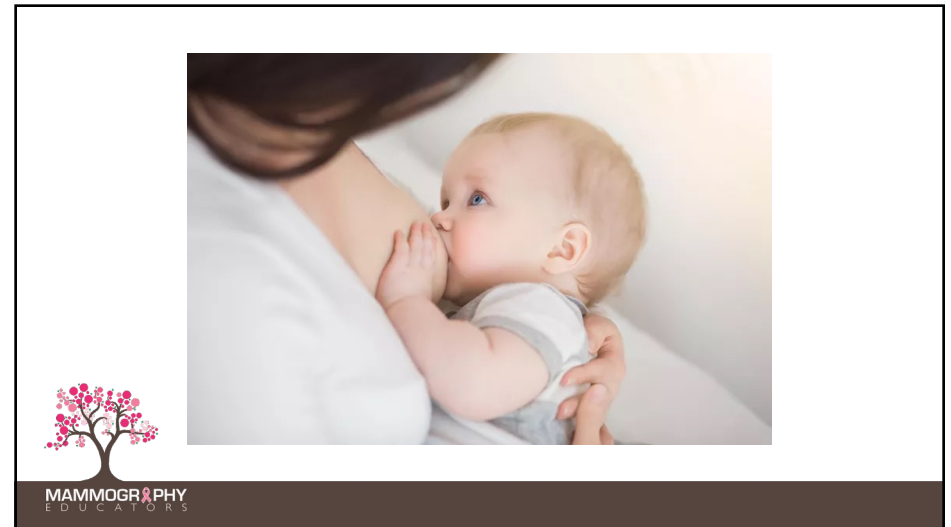
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Glandular Tissue

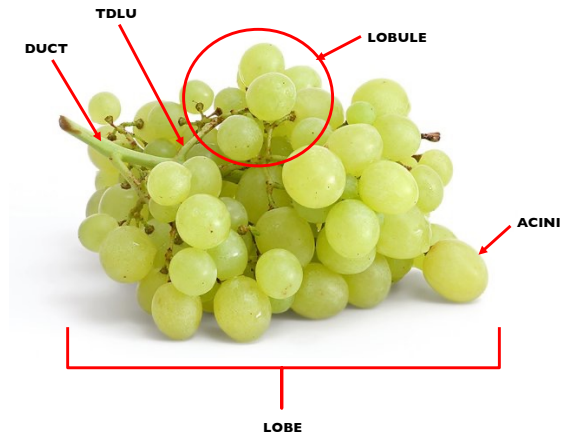
A gland secretes something. In the breast, all the components that produce/secrete/deliver milk are considered glandular tissue.

- Duct
- Lobes
- Lobules
- Terminal ductal lobular units (TDLU)



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Glandular Tissue

- **Ducts**
- Lobes
- Lobules
- Terminal ductal lobular units (TDLU)

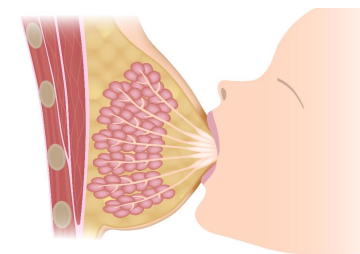


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Ducts

Breast ducts are thin tubes that carry milk from the milk-producing lobules to the nipple, forming a network within the breast tissue.

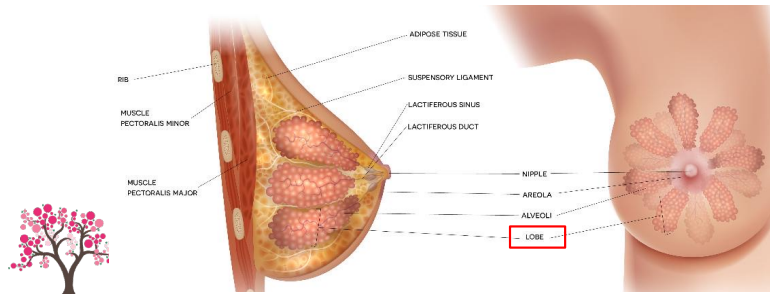


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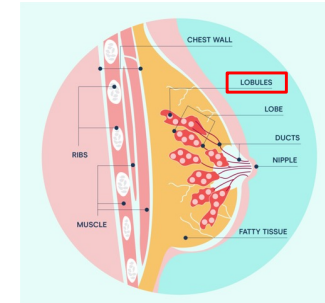
Lobes

The lobes of the breast are sections of the breast that contain lobules, which produce milk. Each breast contains 15-20 lobes.



Lobules

Lobules are small, glandular structures within the female breast that are responsible for milk production.



Glandular Tissue

- Ducts
- Lobes
- Lobules
- **Terminal ductal lobular units (TDLU)**



Terminal Ductal Lobular Unit (TDLU)

- Is the functional part of the breast
- The site where most pathology develops, whether benign or malignant
- Divided into 3 sections



Glandular Tissue

- Ducts
- Lobes
- Lobules
- **Terminal ductal lobular units (TDLU)**



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Terminal Ductal Lobular Unit (TDLU)

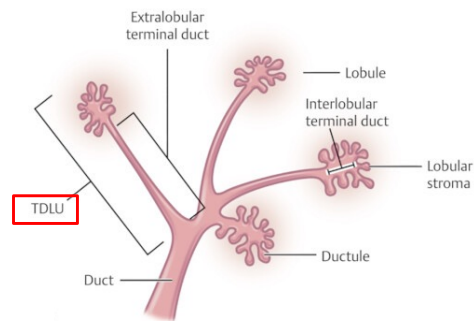
- Is the functional part of the breast
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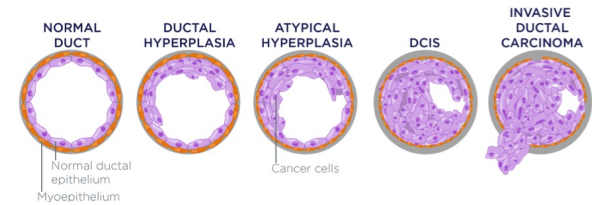
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Terminal Ductal Lobular Unit (TDLU)



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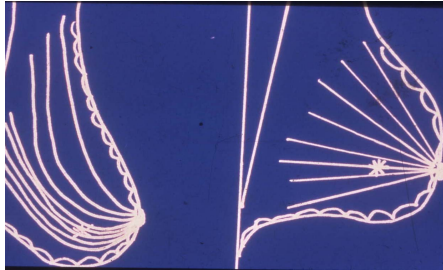
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Breast Sagging



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Courtesy of Stephen Feig, MD

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Question 2

Technologists are required to perform _____ mammograms every _____ in order to meet MQSA requirements.

- a. 100, 2
- b. 200, 2
- c. 400, 2
- d. 50, 1



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Question 3

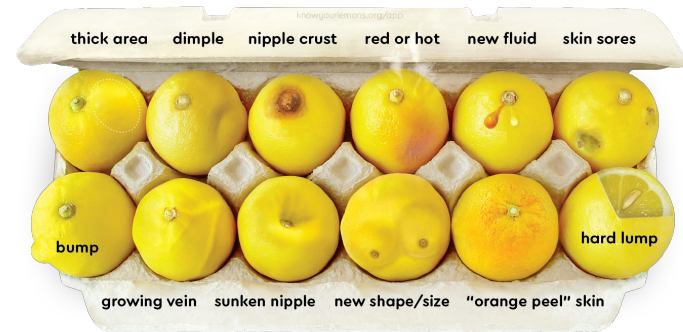
Which of the following could be a symptom of breast cancer?

- a. Chronic nipple inversion
- b. Retraction
- c. Both of the above
- d. None of the above



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Source: knowyourlemons.org

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Question 4

The pectoralis muscle should be visualized approximately ___% of the time on the CC view.

- a. 25%
- b. 50%
- c. 10%
- d. 75%



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Reasonable Expectations for the CC

| | Positioning Criteria | FFDM | DBT | Bassett |
|---------|-----------------------------------|------|-----|---------|
| CC View | Pec Muscle Visualized | 48% | 50% | 32% |
| | No Motion | 100% | 98% | - |
| | Lateral Glandular Tissue Included | 73% | 81% | 37% |
| | Nipple in Profile | 83% | 85% | 89% |
| | Skin or fat folds | 39% | 47% | 10% |
| | Medial Location | 16% | 23% | - |
| | Lateral Location | 29% | 32% | - |
| | Visualization of Cleavage | 41% | 34% | - |
| | Requires More Than One View | 5% | 7% | - |



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Source: American Journal of Roentgenology; 209, December 2017

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Standardized Method

1. Elevate the breast to the correct height
2. Pull the breast on with both hands
3. Anchor the breast
4. Push the patient in with your elbow/arm
5. "Crawl" up on the chest wall to include more pec muscle



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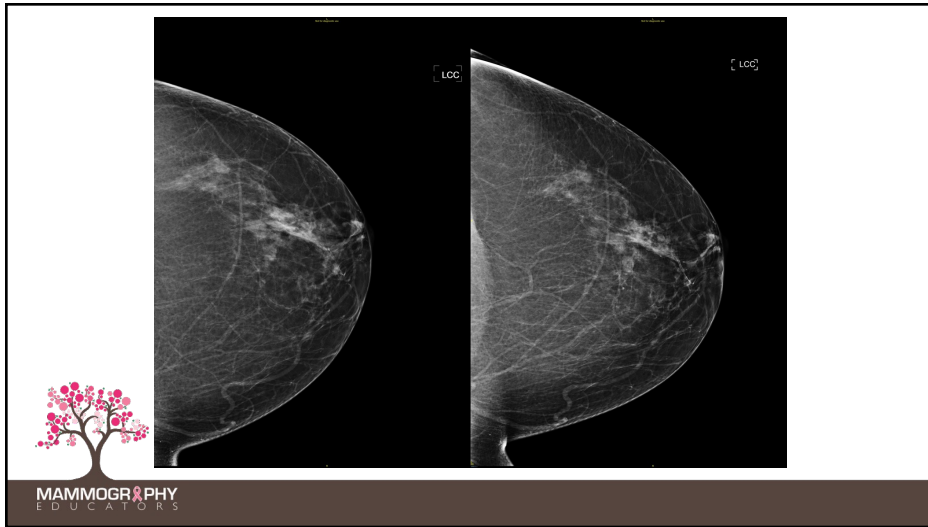
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Elevate the breast so the PNL is perpendicular to the chest wall and *pull* the breast on with both hands.



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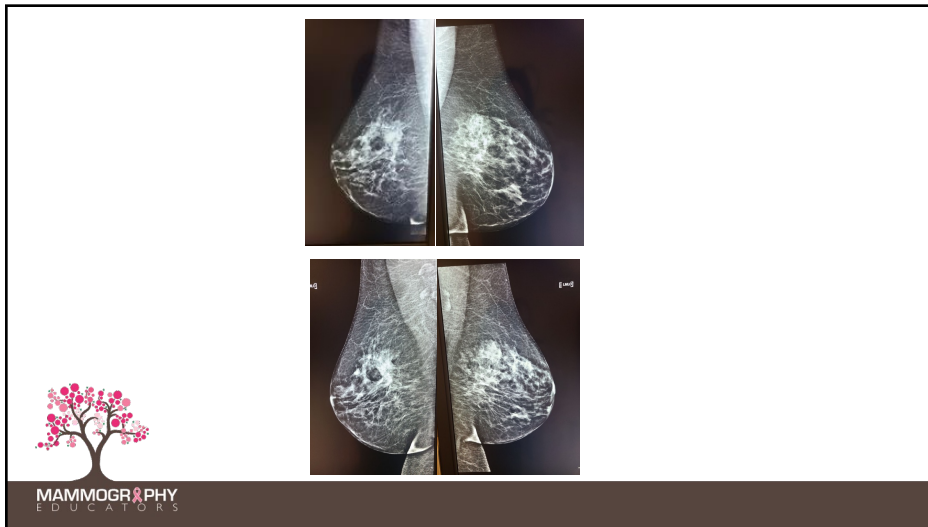
Question 5

What degree of angulation on the MLO should be used for patients who have undergone breast reduction?

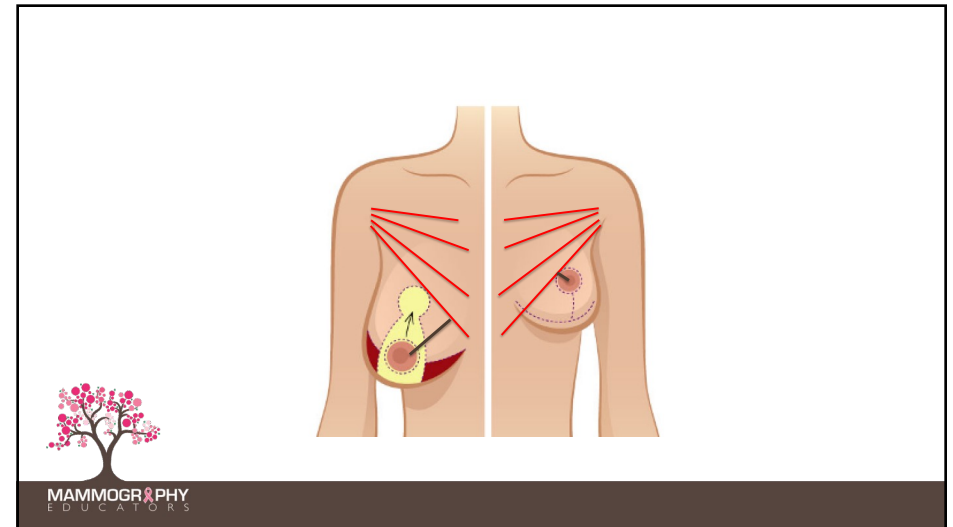
- a. 65
- b. 35
- c. 50
- d. 45



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31



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Question 6

Which of the following are normal findings on post reduction mammoplasty?

- a. Fat necrosis
- b. Cranial displacement of the nipple
- c. Shortened pec muscle on the MLO
- d. All of the above



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Radiographic Changes After Reduction Mammoplasty

- Alteration of breast contour
- Elevation of the nipple
- Displacement of breast parenchyma
- Architectural distortion
- Fat necrosis
- Suture calcifications
- Skin thickening
- Retroareolar fibrotic band
- Disruption of subareolar ducts



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Question 7

Of all breast cancers, what percentage occurs in men?

- a. 1%
- b. 3%
- c. 5%
- d. 7%



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Breast Cancer in Men

- While breast cancer is far more common in women, men can also develop it, though it's rare, accounting for less than 1% of all breast cancer cases.
- Key symptoms include a lump, nipple changes, or skin changes, and prompt medical attention is crucial if any concerns arise.



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Breast Cancer in Men

- **Rarity:** Breast cancer in men is uncommon, with only about 1% of all breast cancer cases occurring in men.
- **Incidence:** In the United States, about 2,650 men are diagnosed with breast cancer each year.



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Breast Cancer in Men

Risk Factors: While the exact causes of male breast cancer are not fully understood, some risk factors include:

- **Family History:** A family history of breast cancer, especially on the maternal side, can increase a man's risk.
- **Genetic Mutations:** Inherited gene mutations, such as those in the BRCA1 and BRCA2 genes, can also increase the risk of breast cancer in men.
- **Age:** The risk of breast cancer increases with age, and it's most common in men between 60 and 70 years old.



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Breast Cancer in Men

Other Factors: Other factors that can increase a man's risk include:

- Obesity
- Alcohol Consumption
- Exposure to certain chemicals



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Breast Cancer in Men

Symptoms: Common symptoms of breast cancer in men include:

- **Lump or Swelling:** A lump or swelling in the chest or underarm area.
- **Nipple Changes:** Changes in the nipple, such as nipple discharge (clear or bloody), nipple retraction (turning inward), or a rash on the nipple.
- **Skin Changes:** Changes in the skin on the chest, such as dimpling, puckering, or redness.



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Question 8

Serpiginous calcifications in the breast appear to be:

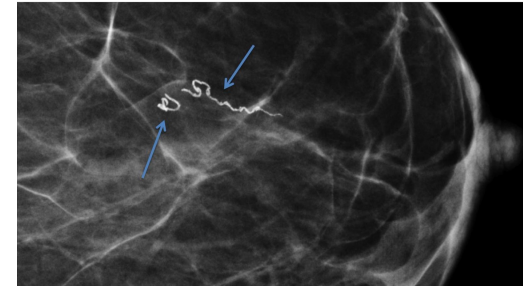
- a. Straight
- b. Coiled
- c. Radiolucent
- d. Similar to dermal calcifications



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Serpiginous calcifications in the breast, appearing as worm-like or coiled linear calcifications on mammograms, are often associated with filariasis, a parasitic infection, and are typically benign.



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Question 9

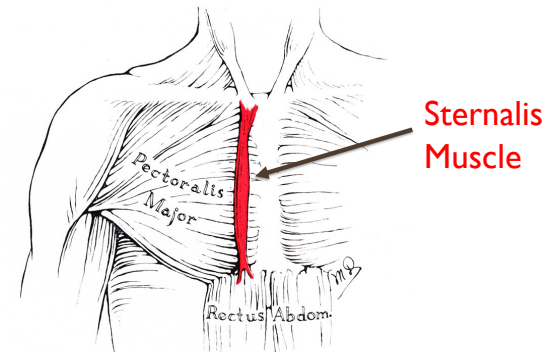
If visualized on a mammogram, the sternalis muscle will appear in the _____ aspect on the _____ view.

- a. Medial, CC
- b. Lateral, CC
- c. Medial, MLO
- d. Lateral, MLO



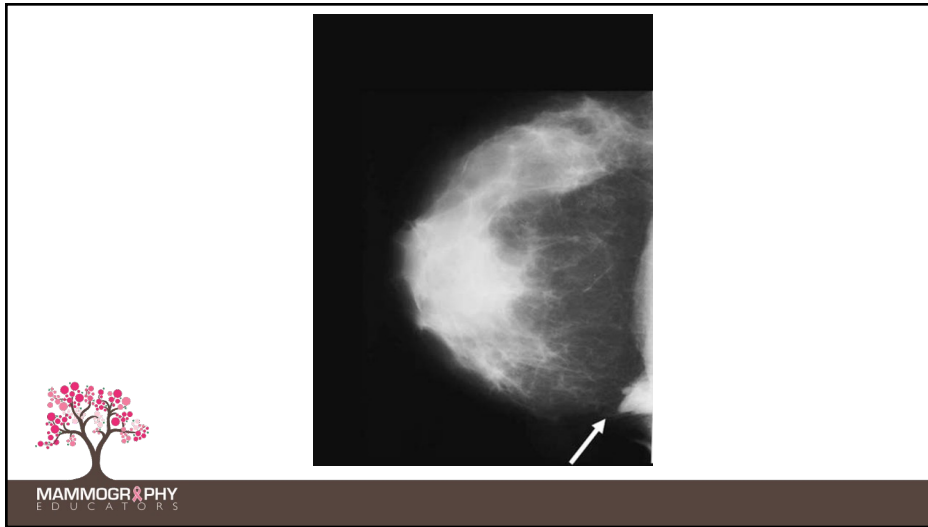
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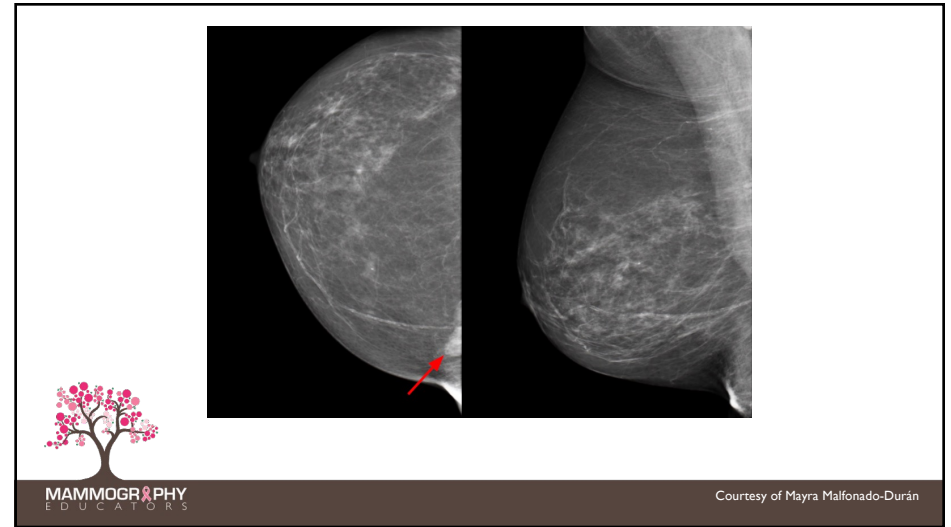


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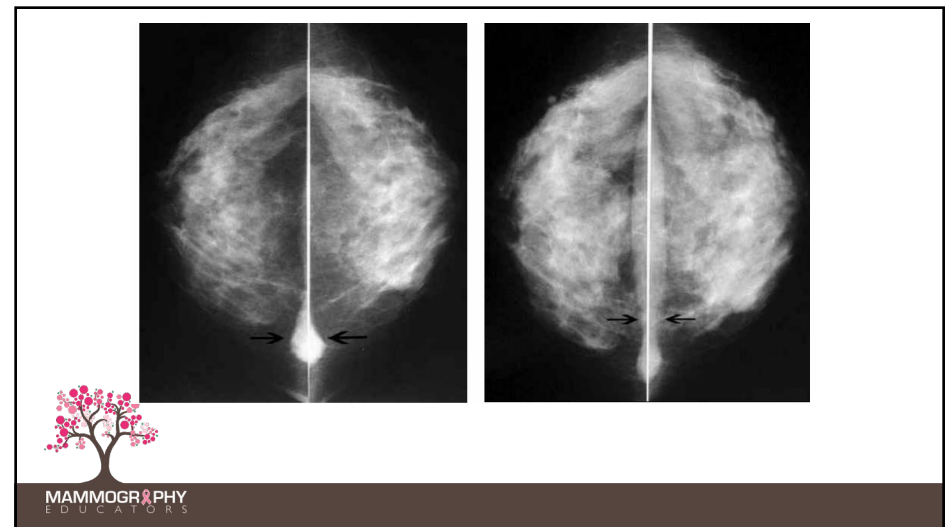
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Sternalis Muscle

- Flame-like appearance (similar to an appendix)
- Present in only 7-10% of the population
- Seen medially on a mammogram
- Often misdiagnosed as the insertion of the pectoralis muscle



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Question 10

The length of the PNL on the CC should be within _____cm of the PNL measurement on the MLO.

- a. 0.25
- b. 0.50
- c. 1.0
- d. 1.5



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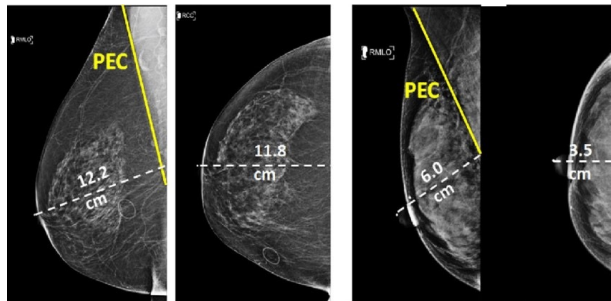
How to Correctly Measure the PNL



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Example of BAD Information Found Online



Well-positioned Mammogram

Inadequately positioned Mammogram



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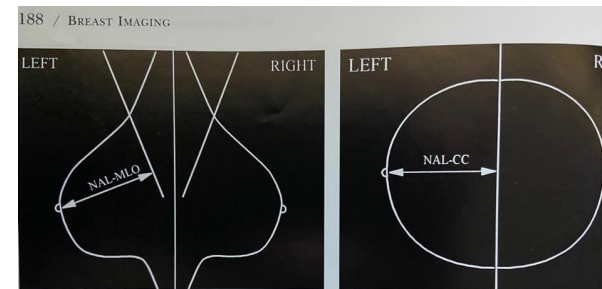


FIG. 10-27. (A) Schematic indicating the visualization of the pectoralis major on the mediolateral oblique (MLO) down to the level of the nipple axis line (NAL) on the MLO. (B) The corresponding line from the nipple to the back of the film on the craniocaudal should be no more than 1 cm shorter than the NAL on the MLO. If it is shorter, there is likely breast tissue that is not being projected onto the detector.

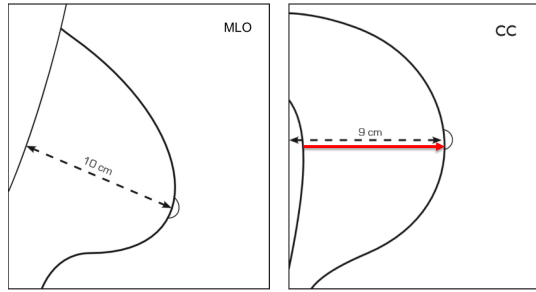


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Source: Breast Imaging, 3rd Edition 2006

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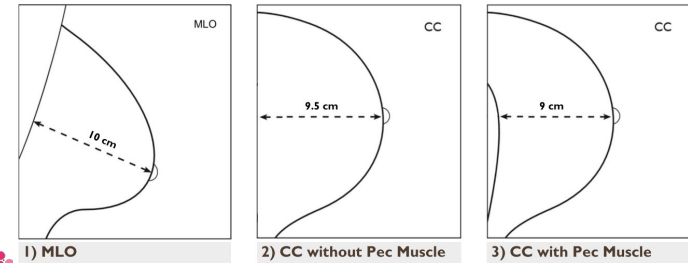
PNL Measurements



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PNL Measurements

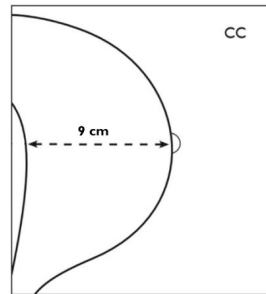


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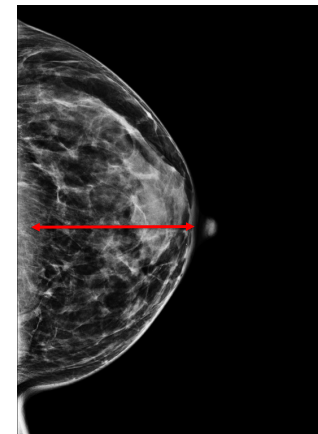
Measurement of the CC

Measurement is made from the base of the nipple/skin line to the anterior margin of the pectoralis muscle (if visualized).



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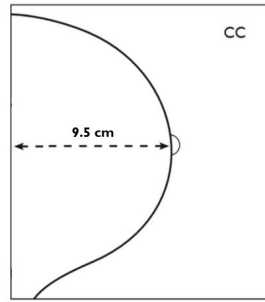


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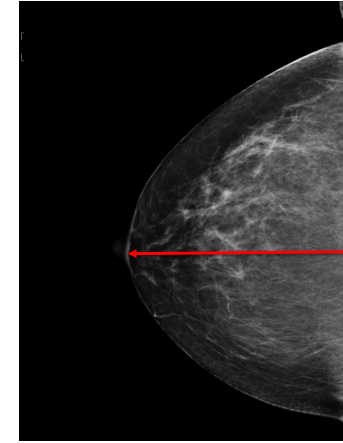
Measurement of the CC

Measurement is made from the base of the nipple/skin line to the edge of the image (if the pectoralis muscle is **not** visualized).



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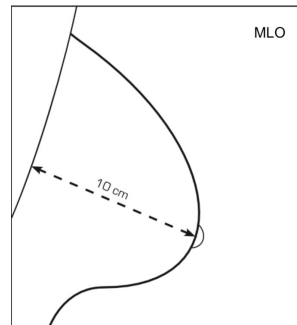


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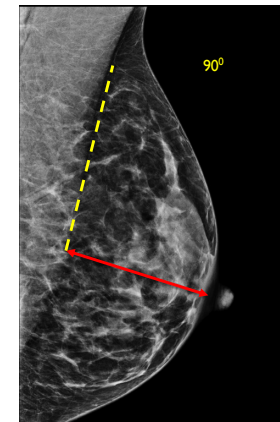
Measurement of the MLO

Measure from the base of the nipple to the anterior margin of the pectoralis muscle where the intersection can be measured as a 90-degree angle.



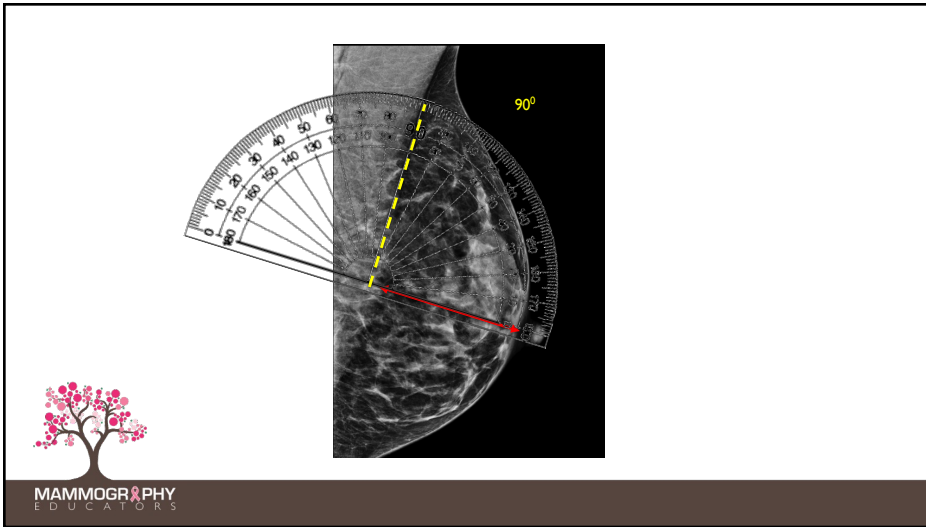
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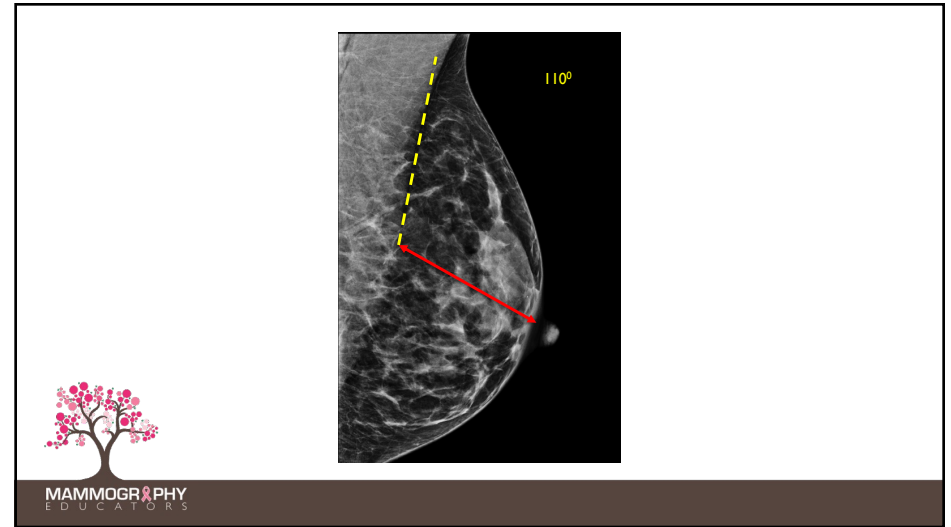


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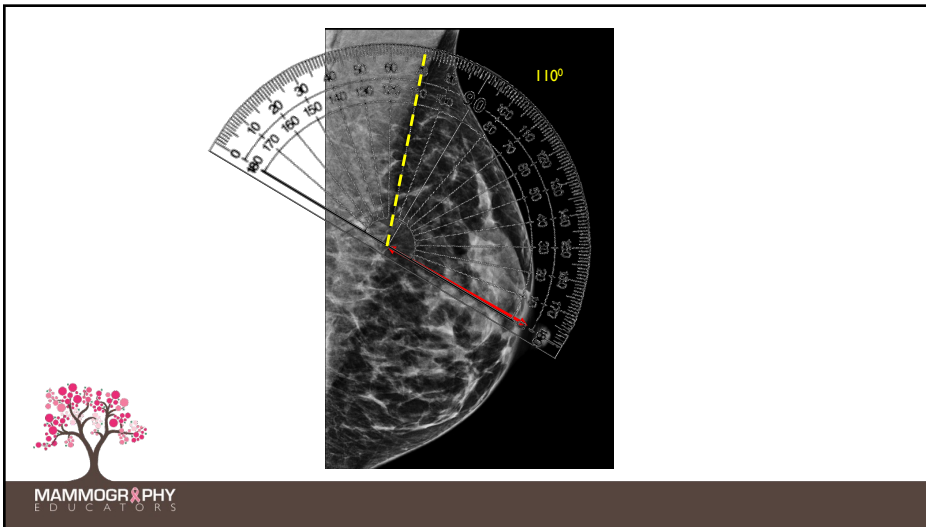
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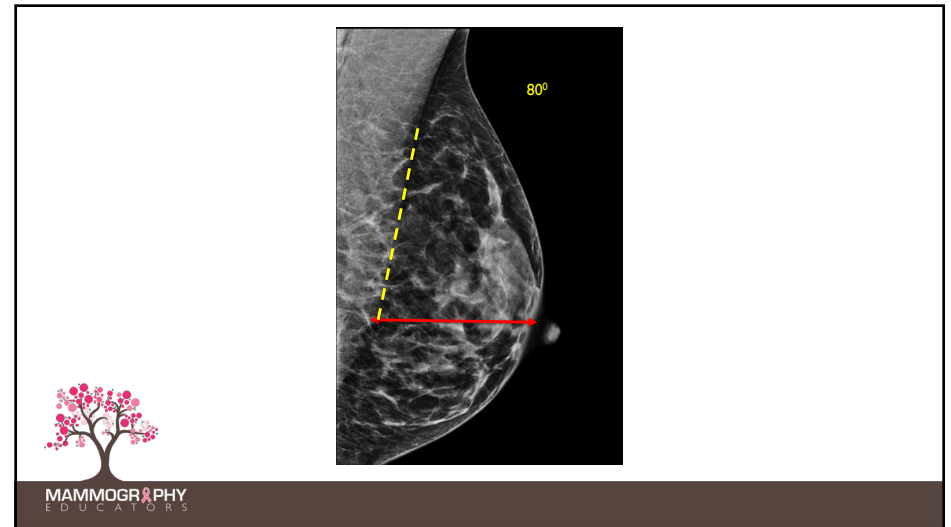
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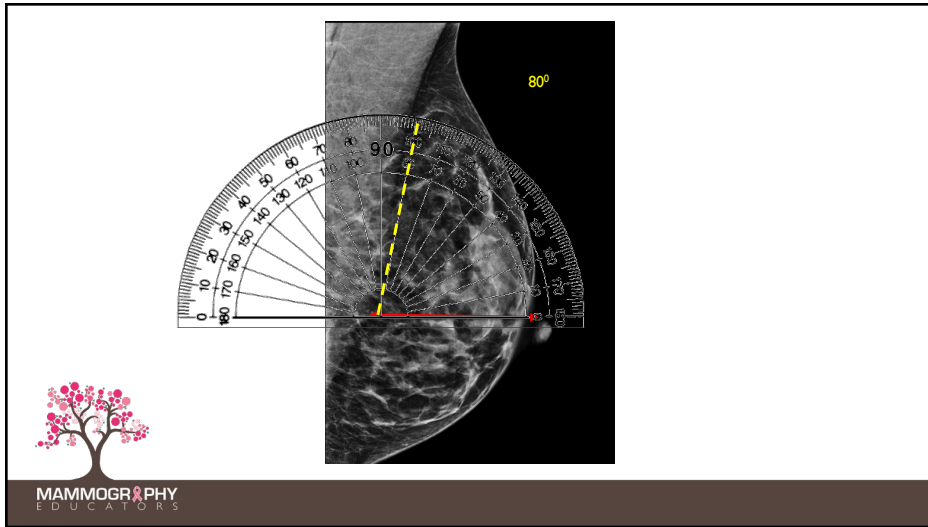
62



63



64



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PNL Dilemmas

- What if the nipple is not centered?
- What if there is inadequate muscle is (short or concave) on the MLO?
- What if the nipple is not in profile?

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PNL Dilemmas

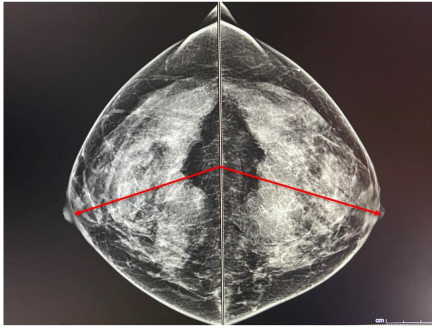
oh noo!!!!!!!!!!!!!!!!!!!!!!

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PNL Dilemmas

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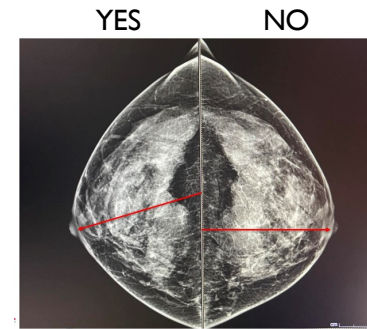
Measurement of PNL if Nipple Not Centered



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Nipple Not Centered



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The Great PNL War of 2023



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PNL Measurements on CC and MLO

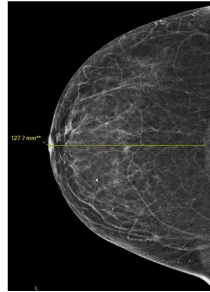


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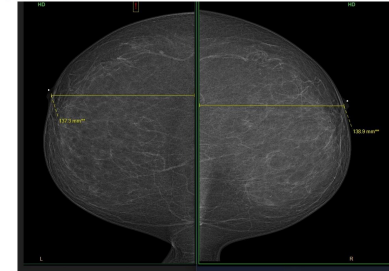
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PNL Measurement on CC

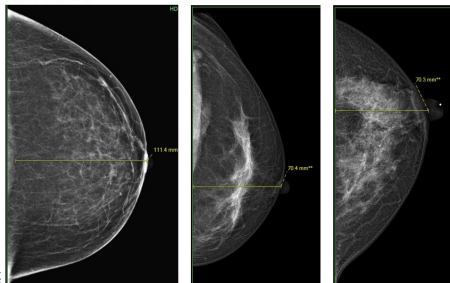
- PNL on CC view is measured along a line that extends directly posteriorly from the base of the nipple to the pectoral muscle or the edge of the film, whichever comes first!



PNL Measurement on CC



PNL Measurement on CC



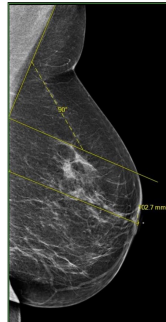
PNL Measurement on MLO

- To measure the PNL on MLO view, you need to accurately determine a 90-degree angle. This is done using the angle function on your PACS or Review Workstation (RWS) systems.
- The following slides show 3 ways to measure the PNL on MLO view when the pectoral muscle doesn't reach the nipple line.



Option 1

- Draw a line from the superior aspect of the pectoral muscle inferiorly along its anterior border to where the pectoral muscle ends at the edge of the image.
- Make a line from the base of the nipple back to the pectoral muscle OR the edge of the image if the pectoral muscle is short. You will slide that same line up to the pectoral muscle line to ensure the angle is 90 degrees. Once you confirm it is 90 degrees, slide this same line down to the base of the nipple and see what the distance is.



ACR LEARNING NETWORK

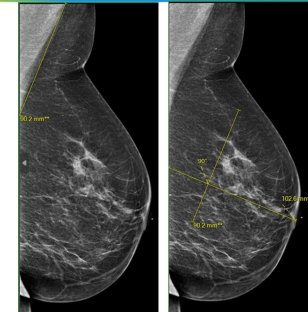


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Option 2

- Draw a line from the superior aspect of the pectoral muscle inferiorly along its anterior border to where the pectoral muscle ends at the edge of the image.
- Slide this line down and anteriorly to the mid breast. Draw a line from the base of the nipple back to the edge of the image, intersecting the other line at a 90-degree angle.



ACR LEARNING NETWORK

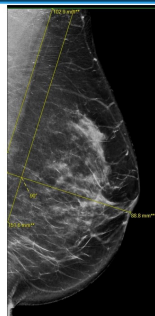


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Option 3

- Draw a line from the superior aspect of the pectoral muscle inferiorly along its anterior border to where the pectoral muscle ends at the edge of the image.
- Draw a line parallel and anterior to the first line and extend it down past the nipple line. Next, draw a line from the base of the nipple back to the edge of the image, intersecting the second line at a 90-degree angle.



ACR LEARNING NETWORK



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Question 11

The XCCL view is needed approximately ___% of the time on all screening exams.

- a. 5 or under
- b. 10
- c. 20
- d. 30



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Question 12

The *primary* use of the CC view is to:

- a. Visualize the breast in a different projection
- b. Visualize medial breast tissue
- c. Visualize lateral breast tissue
- d. Visualize the nipple in profile



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Question 13

Fat necrosis is:

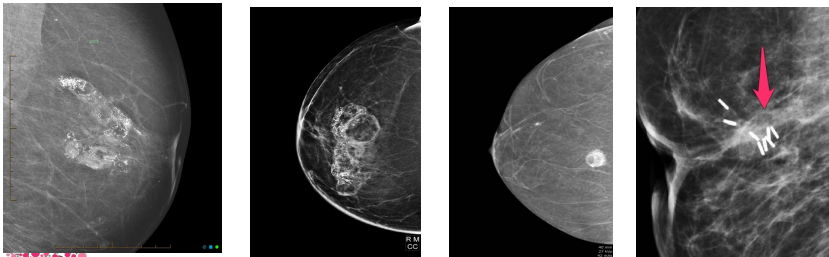
- a. The death of fatty tissue
- b. Can result from biopsy, trauma or radiation
- c. Is usually dense on a mammogram
- d. All of the above



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Fat Necrosis



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Question 14

Abscesses of the breast:

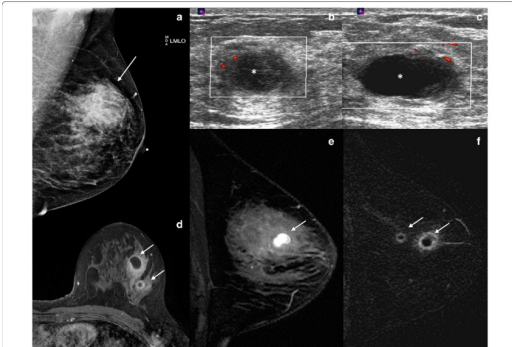
- a. Most commonly occurs during lactation
- b. Are usually located in the UOQ
- c. Are rarely painful
- d. None of the above



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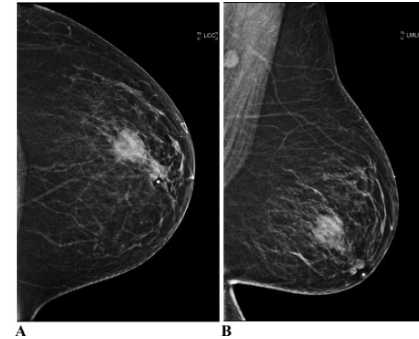
Breast Abscess



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Breast Abscess



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Question 15

What is the active ingredient in the contrast agent used for MRI of the breast?

- a. Gadolinium
- b. Amorphous
- c. Selenium
- d. Cesium iodide



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Gadolinium

Gadolinium (Gd) is a silvery-white, malleable, and ductile rare-earth metal with paramagnetic properties, commonly used as a contrast agent in magnetic resonance imaging (MRI) to enhance image quality.



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Gadolinium

- While generally safe, GBCAs have raised safety concerns, particularly regarding their potential for retention in the body, especially in individuals with kidney problems
- Nephrogenic Systemic Fibrosis (NSF):
 - In rare cases, gadolinium retention can lead to a serious condition called NSF, characterized by skin and organ fibrosis



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Gadolinium

The Food and Drug Administration (FDA) has taken several actions to address these safety concerns, including requiring new patient medication guides and conducting further studies.



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Gadolinium

Recent studies have confirmed gadolinium accumulation in the human brain following repeated gadolinium-based contrast agent administrations. However, the impact of the retained gadolinium in the brain remains unknown, which needs large prospective studies to clarify in future. It is recommended to take caution when using this contrast agent and keep as low doses as possible for reducing gadolinium accumulation in brain.



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Question 16

Which of the following is the best option for imaging a lactating breast?

- a. Imaging is never recommended
- b. Patient should empty the breast before imaging
- c. Patient should empty the breast after imaging
- d. Increase the mAs to insure better visualization of ducts



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Screening Mammography

- Is appropriate for lactating women based on age and breast cancer risk status, similar to non-lactating women.
- Breast imaging evaluation should not be delayed during lactation, and recommended screening and diagnostic protocols are dependent on age, breast cancer risk status, and whether the patient is lactating.



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Question 17

What is it called when a patient is born without a pectoralis muscle?

- a. Poland's syndrome
- b. Shephard's syndrome
- c. Pectoralisless
- d. Pectus carinatum



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Poland's Syndrome



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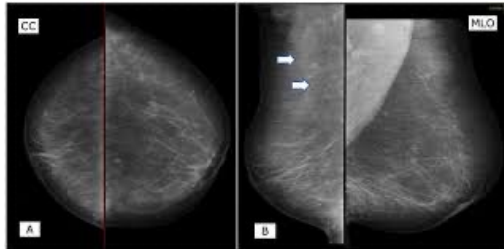
Poland's Syndrome



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Poland's Syndrome



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Question 18

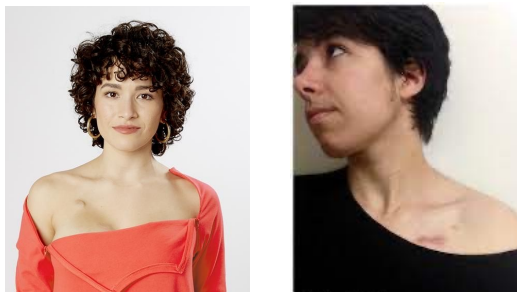
An example of an iatrogenic device would be:

- a. Pacemaker
- d. Implant
- c. Skin marker
- d. Any of the above



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Question 19

The best additional view for imaging a patient with an iatrogenic device would be a:

- a. LM or ML
- b. TAN
- c. LMO
- d. SIO

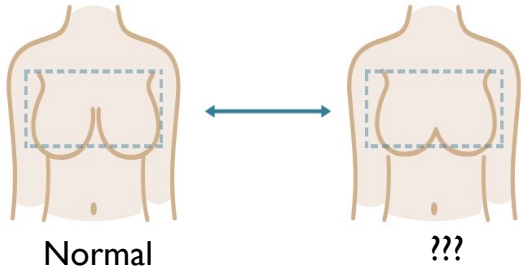


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Question 20

What is the medical terminology for “webbed” breasts?



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Question 20

What is the medical terminology for “webbed” breasts?

- a. Uniboob
- b. Mastoosis
- c. Symmastia
- d. Duomastia



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Symmastia



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Congenital Symmastia



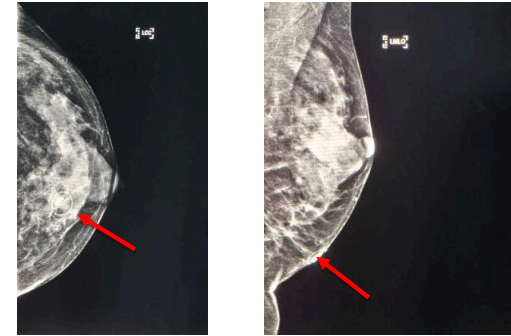
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Defect of Surgical Breast Augmentation



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Question 21 What do you think this is?



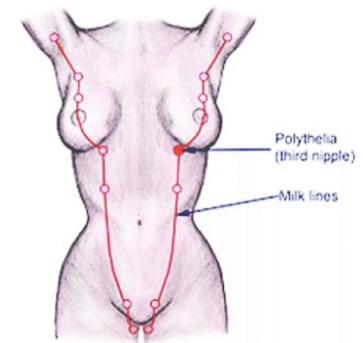
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Polythelia or Ancillary Nipple



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Embryonic Milk Line



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Question 22

What do you think this is?



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Ancillary/Accessory Breast



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Axillary Fat Pad



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Now count the number of questions
you have answered correctly.....



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THANK YOU!

One Brooklyn Health 2025 Breast Imaging Update Virtual Conference



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