

**Breast Radiology
In-Training Test Questions
for Diagnostic Radiology Residents**



QUALITY IS OUR IMAGE

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Sponsored by:

Commission on Education

Committee on Residency Training in Diagnostic Radiology

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1. A lesion is seen in the upper breast on the MLO but not on the CC projection. Which one of the following views is LEAST likely to help localize the lesion?
- A. **Tangential**
 - B. 90-degree lateral
 - C. Laterally exaggerated CC
 - D. Medially exaggerated CC

Rationale:

A. Additional views can help localize a lesion seen in only 1 projection. A 90-degree lateral may help; if the abnormality is positioned lower on the 90-degree projection than on the MLO, the lesion is likely to be in the outer breast. A lesion that moves up on the ML view is expected to be an inner breast lesion. Exaggerated CC views can help by including tissue far lateral or medial, not seen on the standard CC projection, thus revealing lesions in these locations. The tangential view is used to verify suspected skin lesions and might yield information in certain superficial lesions but would not likely help in the scenario presented.

- B. None
- C. None
- D. None

Reference:

None

2. You are shown CC (Figure 6A) and magnification CC (Figure 6B) mammograms. Which of the following malignant lesions is MOST LIKELY?
- A. Tubular carcinoma
 - B. Lobular carcinoma
 - C. **Papillary carcinoma**
 - D. Paget's disease

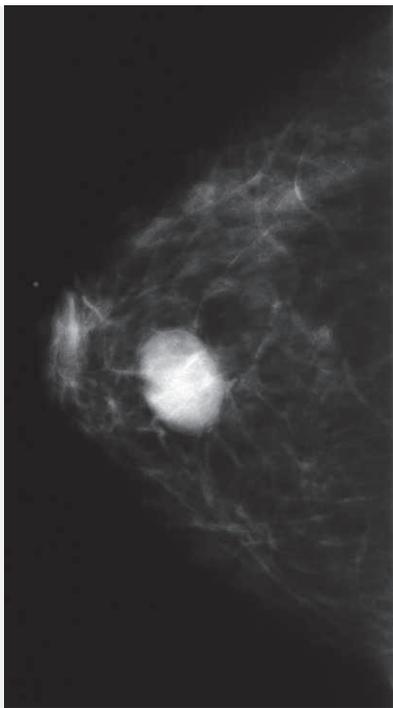


Figure 6.A

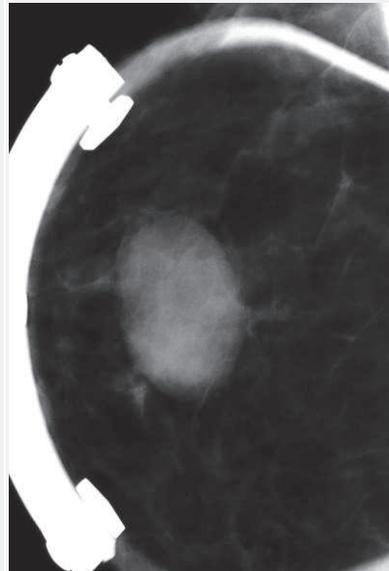


Figure 6.B

Rationale:

- A. Tubular carcinoma typically presents as a spiculated mass, not a well-circumscribed mass as seen here.
- B. Lobular carcinoma is more typically an indistinct mass than a circumscribed mass.
- C. Of the choices given, papillary carcinoma is most likely to present as a circumscribed mass, as shown here. It is a relatively well differentiated tumor with a better prognosis than ductal carcinoma, not-otherwise-specified.
- D. Paget's disease involves the nipple and can be associated with either DCIS or underlying invasive disease. While possible in this case, it is not the best answer.

Reference:

None

3. In mammography, adequate breast compression results in which of the following?
- A. Elimination of grid
 - B. Increase in radiation dose
 - C. Increase in dynamic range
 - D. **Decrease in scatter radiation**

Rationale:

- A. A grid is needed for scatter rejection even when compression is used
- B. Reducing tissue thickness with compression allows for use of a lower mAs which results in lower radiation dose
- C. Compression results in reduced exposure dynamic range by spreading out tissue and achieving a more uniform thickness
- D. Due to the decrease in tissue thickness, the scatter to primary ratio for a compressed breast is 0.4-0.5 while the scatter to primary ratio for an uncompressed breast is 0.8-1.0.

Reference:

Bushberg JT, Seibert JA, Leidholdt EM, Boone JM. The Essential Physics of Medical Imaging, 2nd Edition, p.207.

4. Which quality control test must be performed on a WEEKLY basis?

- A. Processor quality control
- B. **Phantom images**
- C. Screen film contact
- D. Visual checklist

Rationale:

- A. Processor QC should be performed daily
- B. Phantom images must be performed weekly
- C. Screen film contact must be performed semiannual
- D. Visual checklist must be done monthly

Reference:

MQSA guidelines

5. The Mammography Quality Standards Act (MQSA) requires which use of the BI-RADS terminology?
- A. Use in mammography, breast ultrasound, and breast MRI reports
 - B. Reporting breast density in mammography reports
 - C. **Assigning assessment category in mammography reports**
 - D. Use in letters that describe results to patients

Rationale:

- A. This is an incorrect choice because MQSA does not extend to breast ultrasound or breast MRI exams.
- B. This is an incorrect choice because MQSA does not require the reporting of breast density.
- C. This is the correct choice because MQSA requires the assignment of BI-RADS assessment categories (0, 1, 2, 3, 4, or 5) in mammography reports.
- D. This is an incorrect choice because letters should be in lay terms.

Reference:

Farria DM, Monsees B. Screening mammography practice essentials. Radiol Clin North Am. 2004; 42:831-43

6. Which quality control test must be performed DAILY?

- A. Phantom image evaluation
- B. Repeat analysis
- C. **Processor QC**
- D. Darkroom fog

Rationale:

- A. Incorrect
- B. The repeat analysis should be performed quarterly.
- C. Processor QC should be performed daily at the start of the workday before any patient films are put through the processor.
- D. Darkroom fog should be tested semiannually.

Reference:

None

7. In film-screen mammography, film performs multiple functions that are coupled together. In digital mammography, these same functions are decoupled so that each may be optimized independently. Which of the following are the multiple functions?
- A. Image acquisition, scatter rejection, and archive
 - B. Image acquisition, display, and magnification
 - C. **Image acquisition, display, and archive**
 - D. X-ray absorption, scatter rejection, and display

Rationale:

- A. scatter rejection is accomplished by a grid
- B. magnification cannot be accomplished with film alone
- C. Correct
- D. x-ray absorption is accomplished by a phosphor screen, scatter rejection is accomplished by a grid

Reference: Mahesh M, AAPM/RSNA Physics Tutorial for Residents: Digital Mammography: An Overview, RadioGraphics 2004; 24:1747 -1760

8. Which of the following findings on MRI is MOST suggestive of a malignant breast mass?

- A. Mild enhancement curve
- B. **Enhancement washout curve**
- C. Homogeneous enhancement
- D. Dark internal septations

Rationale:

- A. Breast cancer will enhance brightly with marked uptake not mild enhancement.
- B. Washout curves are highly suspicious of malignancy.
- C. Breast cancer will enhance heterogeneous reflecting areas of varied activity and necrosis.
- D. Septations are usually not present and if present will be bright.

Reference:

Morris, Elizabeth and Laura Leiberan. Breast MRI, pp. 173-183. ACR Lexicon for Breast MRI. A breast cancer will enhance brightly with rapid uptake and rapid washout of contrast. The enhancement pattern will be heterogeneous representing areas of varied activity and possible necrosis. Septations are usually not present and if present will enhance and be bright.

9. Concerning duct ectasia, which of the following is TRUE?
- A. It must be bilateral to make the diagnosis mammographically.
 - B. **The associated calcifications may contain internal lucencies.**
 - C. It carries an increased risk for breast cancer.
 - D. It is associated with previous bacterial infection.

Rationale:

- A. In duct ectasia the secretions in the ducts often calcify, producing the typical secretory calcifications seen as rod like calcifications. These calcifications are commonly diffuse and bilateral but can be unilateral and more focal.
- B. The calcifications in duct ectasia can contain internal lucencies when the calcifications occur on the outside of the duct.
- C. Ductal ectasia does not increase a woman's risk of breast cancer.
- D. Duct Ectasia is a chemical mastitis.

Reference:

None