

Mammography Practice Test

1. A woman should be counseled to perform monthly breast self-exams beginning at age

- a. 18
- b. 20
- c. 40
- d. 50

2. Breast sonography is not appropriate for

- a. Pregnant women
- b. Women with dense breasts
- c. Women with implants
- d. Routine screening

3. Which of the following is NOT true of breast ductography?

- a. A small needle removes material from a mass, which is smeared onto a slide for interpretation.
- b. It is contraindicated in women who are allergic to contrast dye.
- c. Mammography is performed to observe ductal obstructions or masses.
- d. Contrast material is injected into the nipple ducts.

4. MRI with contrast is most useful in showing

- a. Solid breast tumors
- b. Tumors with increased blood flow
- c. Fluid-filled masses
- d. Microcalcifications

5. Early menopause and osteoporosis are side effects of

- a. Tamoxifen
- b. Chemotherapy
- c. Radiation therapy
- d. Mastectomy

6. The large focal spot is usually ____ millimeters in size.

- a. 3.0
- b. 1.0
- c. 0.3
- d. 0.1

7. The film cassette should be allowed to rest for ____ minutes before being exposed.

- a. 5
- b. 15
- c. 30
- d. 60

8. Compression force must be maintained between ____ and ____ lbs of force.

- a. 10 and 20
- b. 15 and 35
- c. 25 and 45
- d. 35 and 50

9. Women with thick or dense breasts need a _____ dose of radiation, requiring the technologist to _____ the kVp.

- a. Lower ... lower
- b. Lower ... raise
- c. Higher ... lower
- d. Higher ... raise

10. What controls the length of radiation exposure after the breast tissue has been sufficiently exposed to the radiation?

- a. The anode
- b. The AEC
- c. The x-ray filter
- d. The cathode

11. Which of the following is the distance from the source of the radiation to the image receptor?

- a. Object-image-receptor distance
- b. Source-object distance
- c. Source-image distance
- d. Focal-spot-image distance

12. What is the purpose of the grid?

- a. To convert x rays to light photons
- b. To improve contrast by decreasing radiation scatter
- c. To show the location of the focal spot
- d. For quality control purposes

13. The darkroom must be cleaned each day because

- a. The presence of any dirt or dust may produce artifacts on the film
- b. Of the risk of infection transmission
- c. It can damage the development equipment
- d. Of the potential for a reaction of the dirt with the developing chemicals

14. When is it NOT necessary to process phantom images as a part of quality control measures?

- a. Weekly
- b. After the equipment is serviced
- c. After changing the type of film used
- d. Monthly

Answer Key and Explanations

1. B: Women should perform monthly breast self-exams beginning at age 20. They should have a physician perform a clinical breast exam every three years (from age 20 to 39 and yearly after that) and a yearly mammogram beginning at age 40. If there is a strong family history of breast or ovarian cancer, clinical breast exams and mammography should be performed more frequently.

2. D: The FDA has not approved breast sonography for use as a routine screening tool. However, it is a useful procedure when a woman is pregnant, has dense breasts or silicone implants, or clarifying lesions are detected during mammography.

3. A: Ductography is indicated when there is abnormal discharge from the nipple. A small amount of contrast material is introduced into a single duct in the nipple, and a mammogram is performed. Choice A describes fine needle aspiration. All of the other choices are correct.

4. B: *Magnetic resonance imaging* (MRI) scans are not appropriate as a routine screening tool and are most useful in showing tumors with increased blood flow or those that are close to the chest wall. They do not show microcalcifications. They should not be performed when a woman is pregnant or has metal in her body (such as a metal pin or rod). They are also contraindicated in patients who are allergic to the contrast material or who are too overweight to fit in the MRI machine.

5. A: Many breast tumors are estrogen dependent, meaning that they grow in the presence of estrogen in the body. Tamoxifen, an estrogen inhibitor, is best used for these estrogen-sensitive tumors. Early menopause and the symptoms associated with menopause (such as osteoporosis) are the side effects of this medication. It should not be used in women who are still planning on pregnancy because of the risk for early menopause.

6. C: A focal spot is where the electrons emerging from the cathode connect with the anode. The focal spot size is related to the location where the x-ray beam is most intense where it strikes the patient. The smaller the angle of the anode, the smaller the size of the focal spot. The large focal spot is usually 0.3 mm; it is used for the majority of mammography. The small focal spot is usually 0.1 mm and is used for more magnified views.

7. B: The film cassette allows the film to be placed as close to the patient as possible and should be allowed to rest for 15 minutes before being exposed to allow all of the air to bleed out of the cassette. If air is not allowed to bleed out of the cassette, the image will be negatively affected.

8. C: Compression force must be maintained between 25 and 45 lbs of force. If routine quality control testing shows the compression force to be out of that range, the machine must be serviced immediately. There must also be a mechanism to release the compression force in the event of power loss.

9. C: Women with thick or dense breasts require a higher dosage of radiation because more of the radiation is absorbed by the breast tissue. As a result, the peak kilovoltage (kVP) should be decreased. This increases the amount of radiation exposure and also increases the contrast.

10. B: The AEC, or automatic exposure control, is a sensor found beneath the densest part of the breast and controls exposure length. Electrical energy flows from the anode to the cathode to

produce the radiation. The x-ray filter removes excess photons that are not necessary to produce a clear image.

11. C: The source–image distance is the distance from the source of the radiation to the image receptor. The object–image–receptor distance is the distance between the breast and the image receptor. The source–object distance is the distance between the source of the radiation and the breast tissue. The focal-spot–image distance is the distance between the focal spot and the image receptor.

12. B: The grid improves contrast by decreasing radiation scatter. Very thin strips of lead or other metal are placed at a rate of around 60 to 80 strips per centimeter. They absorb extra radiation, thereby reducing scatter. Option A refers to the intensifying screen. Choices C and D are incorrect.

13. A: Dirt and dust particles can contaminate film and produce artifacts on the image. It is extremely important that the darkroom be cleaned each day before developing any film and that any unnecessary items are removed from the darkroom to minimize the risk of contamination.

14. D: A phantom image should be developed and evaluated at least weekly, but also whenever service is performed on the machinery, when the type of film or screen is changed, or to troubleshoot problems.

15. B: The FDA-approved phantom should contain all of the listed characteristics, except that it should be 50% adipose tissue and 50% glandular tissue. The waxy insert should also contain five groups of specks between the diameters of 0.16 and 0.54 mm.

16. D: Unless there is potential for contact with body fluids or moist skin, gloves are sufficient as personal protective equipment (PPE). If there is a risk of coming into contact with body fluids, a gown may be worn over clothes. If going into an isolation room in a hospital, use the PPE as required by your facility for that level of isolation.

17. D: The referring physician should receive a copy of the findings if a malignancy is suspected within 3 to 5 days of the film. Regardless of the result, the patient should also receive a copy of the results within a few days in plain language. If no malignancy is suspected, the referring physician should get the results within 30 days.

18. A: The breast is divided into four quadrants, marked by dividing lines extending through the nipple from the top to the bottom of the breast and across the middle of the breast. Most cancers are found in the upper outer quadrant of the breast, toward the axilla.

19. A: The retromammary space is the space found between the breast tissue and the pectoralis muscle. Fatty or adipose tissue is found in this space. Connective tissue, lymphatic tissue, and fat are also found in the subcutaneous area of the breast. The milk-secreting ducts and lactiferous sinuses are found within the mammary tissue itself.

20. C: The breast is supported by tissue between the second and fourth rib on the vertical plane. It is found between the axilla and the sternum horizontally. Breast tissue extends into the axilla, known as the axillary tail of Spence.

21. D: Approximately 60% of the blood flow to the breast comes from the internal mammary artery, specifically, the anterior perforating branches, which supply the central part of the breast. The upper outer quadrant is supplied by the lateral thoracic artery (approximately 30% of total