

CHAPTER ONE: HISTORY OF MAMMOGRAPHY

1. It was not until the 1960s that _____, the "father of mammography," began teaching his mammographic technique.
A Robert Eibelhaus B Robert Egan C Edgar Josef D Edgar Johnson
2. By the mid-1970s, _____ mammographers reported the advantages of a new position – the oblique view.
A Japanese B Columbian C Scandinavian D Turkish
3. In _____, MRI of the breast was recommended as a screening test done in conjunction with mammography for high-risk women.
A 1984 B 2005 C 2001 D 2007

CHAPTER TWO: BACKGROUND INFORMATION AND . . .

4. Screening mammograms now account for approximately _____% of all mammograms done in the United States.
A 80 B 60 C 45 D 71
5. By the time a nonpalpable 0.5-cm lesion increases in size to a palpable 1 cm, its mass has increased _____ times.
A four B five C two D eight
6. Cancer detected in women younger than _____ is usually more aggressive, with a faster growth rate.
A 70 B 80 C 50 D 90
7. Practicing routine breast self-examination allows lesions to be found about _____ smaller versus those discovered by non-practitioners.
A 0.4 B 0.75 C 0.32 D 0.5

CHAPTER THREE: PATIENT CONSIDERATIONS

8. Even the seating arrangement in the waiting room can affect a patient's level.
A True B False
9. MQSA requires that the patient be given the results of her mammogram:
A in writing B verbally C with a documented call D only by the attending doctor

CHAPTER FOUR: THE MAMMOGRAPHY TECH'S EXPANDING ROLE

10. Age-eligible females from the Baby Boomers (some _____ women) constitute a large portion of women who will need mammograms.
A 300,000 B 5 million C 15 million D 40 million
11. Approximately _____% of all breast cancers occur in women age 40 and over according to the CDC.
A 75 B 82 C 94 D 65
12. The United States experienced its first recorded malpractice litigation in _____, 5 years after George Washington became president.
A 1812 B 1794 C 1854 D 1748
13. In _____ students began graduating from radiology assistant (RA) programs in the United States.
A 2001 B 2002 C 2005 D 1999

CHAPTER FIVE: BREAST ANATOMY AND PHYSIOLOGY

14. The external landmarks of the breast include the nipple, inframammary fold, and:
A lower inner quadrant B base C apex D axilla
15. The supportive structures of the breast are _____ ligaments.
A Cooper's B Cento's C Conn's D Henderson's
16. The two most prominent hormones active in breast physiology are estrogen and:
A ADH B ACTH C progesterone D prolactin

CHAPTER SIX: MAMMOGRAPHIC PATHOLOGY

17. During stage 2 of breast cancer, the tumor size is greater than 2 cm, but less than _____ cm.
A 4 B 6 C 5 D 7
18. Most experts believe that malignant disease develops through a process that starts with:
A mild fever B epithelial hyperplasia C weight loss D fatigue
19. _____ % of women with Paget disease also have an underlying intra-ductal breast cancer.
A 80 B 95 C 60 D 52
20. _____ is the radiologist's greatest aid in determining abnormalities, both benign and malignant.
A Swelling B Redness C Pain D Asymmetry

21. A(n) _____ is an island of glandular tissue separated from the normal ductal structures.

- A sebaceous hyperplasia B seborrhic keratoses C hamartoma D adenosis

CHAPTER SEVEN: MAMMOGRAPHIC POSITIONING

22. In most case, the 2 projections: cranial-caudal (CC) and medio_____ oblique (MLO), provide the best coverage of the breast tissue.

- A lateral B linear C longitudinal D lobular

23. About _____% of patients (about 3 of 20) in a workday will need another view to image tissue missed on the 2-view mammogram.

- A 4 B 7 C 15 D 30

24. Both the patient and technologist will find it easier if the patient is standing rather than sitting for the mammogram.

- A True B False

25. To produce adequate exposure, it is critical to position the _____ tissue over the AEC detector.

- A glandular B fat C nipple D pectoralis major muscle

26. Direct ray (DR) FFDM units supply _____ detector(s) and grid(s).

- A 2 sets of B 3 sets of C only one D 4 sets of

27. The _____ projection will best visualize the subareolar, central, medial, and posteromedial aspects of the breast.

- A craniocaudal (CC) B exaggerated CC C MLO D SIO

28. The pectoral muscle is evident on _____% of CC images.

- A 12 B 20 to 30 C 50 D 70 to 75

29. The _____ projection best visualizes the posterior and upper-outer quadrants of the breast.

- A exaggerated CC B SIO C CC D MLO

30. Regarding MLO positioning, the patient should stand with her hips slightly _____ to the lower end of the image receptor.

- A lateral B medial C posterior D anterior

31. The SIO projection best demonstrates the UIQ _____ of the breast.

- A and LIQ B and LOQ C and UOQ D only

32. The _____ oblique demonstrates the entire glandular island with less superimposition versus the two-projection mammogram.

- A 10 degree B 50 degree C 20 degree D 80 degree

33. The _____ is a useful replacement view for the MLO in patients who have a pacemaker (where compression paddle use is problematic).

- A LMO B CC C AT D LM

34. The _____ position, an anterior-posterior projection, visualizes the axillary components.

- A CC B MLO C SIO D axilla

35. Regarding the tangential (TAN) view, a true lateral projection best visualizes abnormalities that approximate:

- A 12:00 or 6:00 B 3:00 or 9:00 C 4:00 or 10:00 D 2:00 or 8:00

36. An angle of _____ in an SIO or MLO (or sometimes both) projection from the CC will open up overlapped structures.

- A 50 to 60 degrees B 35 to 40 degrees C 5 to 20 degrees D 25 to 35 degrees

37. A '_____ ' view (either the medial roll, RM, or the lateral roll, RL) separates the glandular structures to determine pseudomass.

- A pushed B rolled C clearing D turning

CHAPTER EIGHT: THE NONCONFORMING PATIENT

38. A possible solution when failing to image the posterolateral tissue on the MLO with a small breast is to increase the C-arm angle up to:

- A 40 degrees B 50 degrees C 60 degrees D 70 degrees

39. Adding a _____ MLO (SM-IL) to the standard mammogram can help image the extreme lateral tissue for 'wraparound' breasts.

- A 10 degree B 35 degree C 20 degree D 45 degree

40. Nodal involvement unilaterally implicates a(n) _____ breast cancer.

- A ipsilateral B bilateral C metastatic D primary

CHAPTER NINE: THINKING IN THREE DIMENSIONS

41. 2:00 in the right breast represents the UIQ (upper-inner quadrant), whereas the same time in the left breast represents the:
A LIQ B LOQ C UOQ D UUQ
42. When comparing the MLO projection to the true lateral projection, a lateral lesion will _____ on the lateral from its position on the MLO.
A move up B move anterior C move posterior D move down

CHAPTER TEN: PRACTICAL APPLICATIONS IN PROBLEM SOLVING

43. The false negative (cancers that are not evident on the mammogram) rate for mammograms is about _____ %.
A 3 B 5 to 15 C 15 to 20 D 24
44. An old mammogram can eliminate the need for an extra view.
A True B False
45. Tissue overlap, the effects of _____ ligaments, and blood vessels have all been found to contribute to findings known as mass effect.
A Carter's B Cooper's C Cento's D Anderson's
46. The _____ view is useful to prove skin calcifications.
A right-angle B coned-down magnified C slight oblique D tangential
47. The _____ view can better delineate the borders of a mass.
A CC B right-angle C coned-down magnified D slight oblique
48. Hematoma or seroma presents in early stages as a _____ mass on the mammogram.
A ill-defined B heterogeneous C spiky D smoothly outlined
49. Though breast augmentation surgery is useful for congenital anomalies, about _____ % of them are done for cosmetic purposes alone.
A 80 B 70 C 60 D 50

CHAPTER ELEVEN: ANALOG MAMMOGRAPHY MACHINES . . .

50. A new era of mammography began in the United States in the late _____ with the sale of the first dedicated mammography units.
A 1970s B 1960s C 1950s D 1980s
51. Regarding density selection, there should be a _____ % difference in optical density between steps.
A 5 to 10 B 10 to 15 C 15 to 20 D 20 to 25
52. Regarding the back-up timer, the suggested limits are _____ (minimum/maximum) mAs exposure.
A 100/175 B 175/300 C 250/400 D 250/600
53. Three-quarters of the mass of adipose tissue is composed of _____ atoms.
A nitrogen B oxygen C hydrogen D carbon
54. Regarding breast compression, forces higher than _____ N may be harmful and should not be obtainable.
A 100 B 250 C 350 D 300
55. Magnification _____ the radiation dose.
A increases B greatly decreases C has no effect on D slightly decreases
56. Molybdenum target tubes use molybdenum filters, usually _____ mm thick, to provide an almost monochromatic beam when imaging.
A 0.01 B 1.2 C 0.2 D 0.03
57. Phototimers were first incorporated in mammography units in:
A 1965 B the early 1970s C the early 1980s D 1991
58. Film speed is _____ related to exposure.
A inversely B directly C not D only sometimes
59. Chemistry should be used within _____ weeks of mixing the concentrate with water.
A 1 B 3 C 2 D 4
60. The _____ is used in the darkroom to sensitize, or expose, a step-wedge pattern of varying densities on an xray film.
A densitometer B QC meter C sensitometer D AG meter

61. Radiographic _____ (the random variations in density perceived on an image) represents an important factor affecting image quality.
A noise B contrast C pixel count D fog

CHAPTER TWELVE: DARKROOM AND PROCESSING CONSIDERATIONS . . .

62. The humidity of the air in the darkroom should be set between _____ %.
A 10 and 20 B 20 and 30 C 20 and 40 D 30 and 50
63. Improper ventilation of the darkroom and processor often causes _____ that ultimately leads to environmental artifacts on the film.
A condensation on the rollers B electrical transfer C film pressure D 'plus density'

CHAPTER THIRTEEN: QUALITY ASSURANCE IN FILM/SCREEN . . .

64. For any facility to perform mammography in the United States, it must first be certified by the:
A Food and Drug Administration B Centers for Disease Control C Health Services Department D Health Services Admn.
65. According to MQSA, patient films and reports must be retained for at least _____ years.
A 3 B 5 C 10 D 12
66. Regarding the BI-RADS assessment, category _____ is highly suggestive of malignancy.
A 2 B 3 C 5 D 6
67. Regarding viewboxes, changing the bulbs at least every _____ months is a good rule of thumb.
A 3-5 B 8-10 C 12-18 D 24-28
68. The measured half-value _____ (HVL) is the determinant of beam quality.
A lobe B layer C level D light
69. Regarding cancer identification QA, the number of small cancerous tumors found should be more than _____ % of total cancers found.
A 20 B 30 C 40 D 7

CHAPTER FOURTEEN: END OF ROAD FOR ANALOG MAMMOGRAPHY?

70. The first prototype digital mammography machine was introduced at the _____ RSNA meeting.
A 1995 B 1997 C 1989 D 1999
71. Advance imaging techniques and 3D reconstruction utilize digital acquisition, which is possible with:
A analog or digital systems B analog systems only C digital systems only D neither digital nor analog
72. Regarding digital imaging advantages, the dynamic range by digital mammography (_____:1) is superior over analog (100:1).
A 160 B 1,600 C 2,400 D 16,000

CHAPTER FIFTEEN: CREATING THE DIGITAL IMAGE

73. The four basic functions in xray image production are: acquisition, processing, display, and:
A transfer B reconstruction C storage D deletion
74. Every place on the surface of the digital detector can receive a signal. The spaces, called _____, are arranged in rows and columns.
A dots B pixels C arrays D signals
75. The pixels each contain a transistor connected to a series of wires; this combination is called a _____ film transistor, or TFT.
A transitory B tertiary C thin D thick
76. The digital array captures 16,384 shades of gray. This is contracted to _____ shades in PACS.
A 12,055 B 10,065 C 6,499 D 4,096
77. The computer and monitor interface between the gantry and the technologist is known as the:
A MDRS B AWS C CAD D PACS
78. Directly following exposure termination, the resulting preview image is a partial readout of the signal that accumulates _____ pixels.
A 1.5-2 million B 4-8 million C 8-10 million D 10-25 million
79. 5-MP mammography monitors are 2000 X _____ for a total of 5 million pixels; yet the digital array totals nearly 25 million pixels.
A 1500 B 1750 C 2500 D 3000

CHAPTER SIXTEEN: DIGITAL INTEGRATION AND WORKFLOW . . .

80. Transitioning to FFDM is extremely expensive. It can cost anywhere from \$ _____ and upward.
A 50,000 B 80,000 C 120,000 D 200,000

81. IHE (Integrating the Healthcare —) participation works toward compatibility issues for the mammography community as a whole.
A Enterprise B Enigma C Essentials D Efficiency

CHAPTER SEVENTEEN: QUALITY ASSURANCE FOR FULL FIELD DIGITAL . . .

82. — measures the ratio of the difference between an object's signal intensity and its background to the noise corrupting the signal.
A RNC B NRC C CNR D CRN

83. A(n) — pixel is one that does not respond properly when exposed to radiation.
A dead B flat C exhausted D spent

CHAPTER EIGHTEEN: NONIMAGING COMPONENTS OF FFDM NETWORK

84. — is the maximum rate that data may be transferred across a network.
A Bandwidth B RAID C Redundant array D DICOM

85. — area network (SAN) is the most expensive type of RAID.
A Server B Switch C Storage D Sensitivity

CHAPTER NINETEEN: DIAGNOSTIC PROCEDURES

86. During the localization procedure, a narrow compression paddle (approximately — cm) is usually used.
A 4 B 9 C 17 D 22

87. The main value of — imaging of the breast is in its ability to distinguish a cyst from a solid lesion.
A nuclear B radiographic C sonographic D thermography

88. Ductography is also known as — or contrast-assisted mammography.
A tunnelography B arteriography C galactography D pneumocystography

89. Fine needle aspiration — (FNAC) of the breast is often used to verify a suspected malignancy or to confirm a benign impression.
A cytology B cryology C chorology D cariology

CHAPTER TWENTY: MINIMALLY INVASIVE NEEDLE BREAST BIOPSY

90. Regarding core biopsy, a specially designed — gauge needle or probe is placed in a rapid-fire automated biopsy instrument.
A 2 to 7 B 5 to 9 C 5 to 12 D 8 to 14

91. A — coordinate system defines a target by the distance from a fixed point, and the angular distance from a reference line.
A X-Y B polar C grid D locator

92. Regarding stereotactic breast localization, the reference provides for an exact 3D position to within — mm.
A 1 B 2 C 3 D 4

93. Abnormality nonvisualization can occur when breast thickness is greater, usually — cm or more.
A 6 B 8 C 4 D 10

94. The core biopsy procedure is a "clean" procedure rather than a sterile procedure.
A True B False

95. With an analog machine, obtain the greatest magnification factor by elevating a specimen while using the highest kVp setting possible.
A True B False

96. Each biopsy device (also known as "gun" or "—") is a spring-loaded system with a cocking device and firing button.
A piercer B pointer C sharp stick D driver

97. Regarding vacuum assisted needle biopsies, an 11 gauge needle will render an approximate — mg biopsy.
A 35 to 40 B 40 to 80 C 83 to 110 D 250 to 310

98. The distance from the needle *post-fire* position (tip of the needle) to the breast support (allowing 4 mm for safety) is known as the:
A safety margin B safety line C stroke line D stroke margin

99. Needle calibration is:
A specific to each unit B standard for all units C a complicated process D performed by the radiologist

100. Under no circumstances should a study continue if the clinician cannot identify the abnormality on both stereo images.
A True B False

101. With a _____ vacuum-assisted device, rotation of the collection chamber allows multiple sampling.
 A bidirectional B unidirectional C multidirectional D tri-directional
102. For most patients, the most uncomfortable part of the biopsy procedure is:
 A standing for a long time B the associated anxiety C the sampling sequence D the localization process
103. There _____ foot intake for core biopsy or FNAC alone.
 A a 12 hour NPO B is no need to limit C a 24 hour NPO D a 6 hour NPO
104. When using a prone unit, when the breast is dependent in a lateral projection, the abnormality will appear more _____ than expected.
 A posterior B inferior C lateral D medial
105. Often, placing the patient in a right anterior oblique (RAO) will provide access to the right breast - and the _____ is for the left breast.
 A RAO B LPO C RPO D LAO

106. Greater thickness of the breast creates _____, thereby reducing image contrast.
 A less attenuation B less scatter C more scatter D less photon production

CHAPTER TWENTYONE: BREAST MR

107. A(n) _____ occurs when an object is placed into a magnetic field; all the atoms align in the direction of the magnetic force.
 A magnetic event B magnetic moment C alignment event D alignment moment
108. All _____ are bundled loops of wires that carry radiofrequency signals; all coils are part of an RF system.
 A magnetic fields B cryogens C coils D two-phase cycles
109. The hydrogen atom's property of spin with its _____ phase cycle is the basis for MRI.
 A single- B two- C three- D four-
110. Fat saturation (or fat _____) has many uses in MR imaging, however distinguishing fatty and non-fatty tumors is most important.
 A suppression B contrast C gradient D subtraction
111. One MRI weakness is _____ for anomalies.
 A specificity B sensitivity C distinguishing fat D muscle definition
112. The sensitivity of breast MR has approached up to _____ % in some studies.
 A 35 B 58 C 73 D 100

CHAPTER TWENTYTWO: BREAST CANCER DIAGNOSTIC TECHNOLOGIES

113. _____ is the most recognized adjunctive imaging technology of breast tissue.
 A MRI B Nuclear medicine C Ultrasound D CT
114. Scintimammography is a _____ approach to breast imaging.
 A CT B ultrasound C nuclear medicine D MRI
115. _____ CT generates 3D images with true isotropic resolution – possibly detecting tumors and other diseases in their earliest stages.
 A Cylinder Beam B Cone Beam C Rhombus D Pyramid Beam
116. An estimated _____ % of breast cancers begin in the cells lining the breast ducts.
 A 50 B 95 C 27 D 72
117. A _____ study found that ductal lavage was ineffective at detecting breast cancer among women who had already been so diagnosed.
 A 2001 B 1998 C 2005 D 2004

CHAPTER TWENTYTHREE: BREAST CANCER TREATMENTS

118. Today _____ % of all breast cancers are considered local disease because it is confined to the breast.
 A 35 B 98 C 47 D 61
119. Regarding mastectomy versus lumpectomy, mastectomy would be the surgery of choice if the tumor is larger than _____ cm.
 A 4 B 7 C 9 D 2
120. In contrast to the mechanism of standard external radiation treatment, _____ places the radiation at the tumor site.
 A proximal therapy B brachytherapy C placement therapy D injectotherapy

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15		39		63		87		111	
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19		43		67		91		115	
20		44		68		92		116	
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22		46		70		94		118	
23		47		71		95		119	
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