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Test Questions

Chapter 1

1. The breast cancer mortality has decreased steadily since _____ because of the combination of improved treatments and the benefits of mammography screening.
 - A. 1970
 - B. 1975
 - C. 1978
 - D. 1989

2. Which of the following is/are treatment/s of invasive breast cancer?
 - A. lumpectomy
 - B. chemotherapy and radiation
 - C. mastectomy
 - D. all of the above

3. The early detection is the **most** promising approach for reducing morbidity and mortality from breast cancer?
 - A. TRUE
 - B. FALSE

4. According to the article, many women who would benefit from mammography do not undergo regular screening and others who do undergo regular screening develop breast cancers that were not detected by their mammography exam.
 - A. TRUE
 - B. FALSE

5. According to table 1-1, which of the following imaging technology are approved by FDA for breast cancer screening?
 - A. Film-screen and Full-field digital mammography
 - B. ultrasound
 - C. MRI
 - D. all of the above

6. Novel ultrasound techniques offer which of the following?
 - A. compound imaging (improved resolution)
 - B. 3D imaging
 - C. Doppler imaging
 - D. all of the above

7. Magnetic resonance spectroscopy analyzes tissue's chemical makeup using which of the following?
 - A. radio emissions
 - B. chemotherapy
 - C. ionizing radiation
 - D. all of the above

8. According to the article, which of the following strategies could save women's lives?
 - A. improving breast cancer screening and interpretation of mammograms
 - B. strategy for early detection of breast cancer based on individual
 - C. focusing on outcome from different technologies
 - D. all of the above

Chapter 2

9. Which of the following are **main** uses of Mammography?
 - A. treatment and cure
 - B. screening
 - C. diagnosis

D. Both B and C

10. Which of the following is an **ultimate** purpose of mammography screening?

- A. detect breast cancer at an early stage
- B. to save lives
- C. routine physical
- D. all of the above

11. Diagnostic mammography is also known as _____.

- A. Digital 3D imaging
- B. Doppler imaging
- C. problem-solving mammography
- D. compound imaging (improved resolution)

12. The World Health Organization, WHO has outlined which of the following screening key points in breast cancer and mammography?

- A. The disease being screened is serious and prevalent
- B. The test is sensitive and specific, well tolerated and inexpensive
- C. The test changes therapy or outcome
- D. All of the above

13. _____ refers to the proportion of true-positive results in mammography.

- A. *Sensitivity*
- B. *Specificity*
- C. Positive Predictive Value (PPV)
- D. none of the above

14. _____ refers to the proportion of true-negative results in mammography.

- A. *Sensitivity*
- B. *Specificity*
- C. Positive Predictive Value (PPV)
- D. none of the above

15. _____ refers to the probability that a patient with a positive test actually has the disease.

- A. *Sensitivity*
- B. *Specificity*
- C. Positive Predictive Value (PPV)
- D. none of the above

16. According to the article, the overall evidence in usefulness of mammography indicates that the availability of screening reduces mortality from breast cancer by _____ to _____%.

- A. 5 to 10
- B. 10 to 15
- C. 20 to 30
- D. 35 to 50

17. The breast cancer is difficult to detect in which of the following?

- A. women over 55
- B. radiographically dense breasts
- C. breast with silicone implants
- D. none of the above

18. _____ refers to the relative lightness of a mammogram and is determined by the number of x-ray photons that penetrate the breast.

- A. *Mammographic density*
- B. *Specificity*
- C. Positive Predictive Value (PPV)
- D. *Sensitivity*

19. Fat in breast tissue is radiographically translucent, so x-rays pass through it without absorption and making it appear _____ on x-ray images.

- A. lighter
- B. darker
- C. grainy
- D. none of the above

20 Which of the following generally appear as whiter areas on mammograms because they tend to absorb more x-ray photons?

- A. Breast cancers
- B. microcalcifications
- C. fatty tissue
- D. A and B only

21. _____ is considered as a risk factor for missed cancers.

- A. women over 70
- B. breast density
- C. use of x ray photons
- D. digital mammography

22. Which of the following technologies are **less** affected by breast density?

- A. Ultrasound
- B. MRI
- C. Mammography
- D. A and B only

23. Which of the following factors influence breast density?

- A. obesity, ethnicity and age
- B. stage of menstrual cycle
- C. number of live births
- D. All of the above

24. Mammography is painful for **some** women because it requires _____ of the breast during exam.

- A. compression
- B. x rays
- C. contrast
- D. none of the above

25. According to the article, The Mammography Quality Standards Act (MQSA) requires that women receive their mammogram results within _____ days of testing.

- A. 1
- B. 5
- C. 30
- D. 60

26. If the mammogram is positive, a woman **must** undergo a **secondary** assessment phase involving _____ to establish a definitive diagnosis.

- A. needle and/or open surgical biopsy
- B. chemotherapy
- C. radiation therapy
- D. mastectomy

27. The image quality has improved in mammography significantly and radiation exposure has been greatly reduced, so that the average amount of radiation absorbed during a mammogram is now _____.

- A. high
- B. very low
- C. very high
- D. none of the above

28. There are no large-scale epidemiological studies that have been able to detect an increase in cancer rate due to the radiation exposure in mammography exams.

- A. TRUE
- B. FALSE

29. Due to mammography screening, the diagnosis of ductal carcinoma in situ (DCIS) has increased and it has raised concerns of possible _____.

- A. under treatment
- B. over treatment
- C. deaths

D. none of the above

30. DCIS occurs when malignant _____ proliferate within the breast ducts but remain confined by the basement membrane.

- A. erythrocytes
- B. lymphatic tissues
- C. leukocytes
- D. epithelial cells

31. Women with biopsy-proven DCIS are **typically** treated **surgically** with which of the following?

- A. mastectomy
- B. lumpectomy
- C. chemotherapy
- D. A and B only

Chapter 3

32. In United states and Canada, the mammography screening program started in _____.

- A. 1970
- B. 1975
- C. 1988
- D. 1993

33. Which of the following has designed to improve the delivery of mammography services through quality assurance program in the United States?

- A. MQSA
- B. CDC
- C. ARRT
- D. ASRT

34. What is the average cost of a diagnostic workup following a false-positive mammogram?

- A. \$100 per case
- B. \$500 per case
- C. \$800 per case
- D. \$900 per case

35. An access to mammography services needs to be available in United States regardless of which of the following situation/s?

- A. financial
- B. cultural
- C. educational
- D. all of the above

36. Which of the following factors are associated with lower rates of cancer screening, higher probability for later stage diagnosis and lack of breast health awareness?

- A. low income and higher rates of poverty
- B. lower levels of education
- C. lack of access to health care
- D. all of the above

37. Which of the following was enacted in 1992 to ensure that all women have access to quality mammography for the detection of breast cancer in its earliest stages?

- A. ARRT
- B. CDC
- C. MQSA
- D. ASRT

38. Which of the following is/are Certification Bodies to issue approval for providing mammography services?

- A. Food and Drug Administration (FDA)
- B. State of Illinois
- C. State of Iowa
- D. All of the above

39. _____ requires every mammographic facility to keep track of all positive mammograms including follow-up correlation of pathology results with the interpreting physician's mammography report.
- A. MQSA
 - B. CDC
 - C. ARRT
 - D. ASRT
40. Which of the following was introduced by the American College of Radiology (ACR) to provide a uniform system of assessing mammography results?
- A. HIS
 - B. BI-RADS®
 - C. RIS
 - D. PACS
41. The accuracy of radiologists in interpreting mammograms depends on which of the following factors?
- A. case and practice variation
 - B. training and experience
 - C. type of screening program in which they practice
 - D. All of the above
42. Which of the following factors affect the Quality of Screening Mammography?
- A. Breast density and Breast cancer history
 - B. Individual radiologists
 - C. Health care system
 - D. All of the above
43. _____ systems offer better contrast and lower spatial resolution at a lower radiation dose than traditional screen film mammography.
- A. CT
 - B. MRI
 - C. Digital mammography
 - D. Sonography
44. Digital units probably also improve workflow, allowing radiologists to view images in less than a minute, compared to the 8 to 10 minutes required from screen film systems.
- A. TRUE
 - B. FALSE
45. How is digital mammography **different** than conventional mammography?
- A. it uses x ray films
 - B. it digitizes radiographic data
 - C. it does not use ionizing radiation
 - D. none of the above
46. In 2001, which of the following launched the multi-center DMIST study to compare digital mammography with standard mammography for the detection of breast cancer?
- A. National Cancer Institute (NCI)
 - B. American College of Radiology Imaging Network (ACRIN)
 - C. CDC
 - D. A and B only
47. The digital mammography devices are _____ expensive than conventional devices.
- A. less
 - B. more
 - C. equally
 - D. none of the above
48. What CAD stands for?
- A. Computer-Aided Detection
 - B. Computer Access Device
 - C. Computer Advance Device
 - D. Computer Advantage Data

49. The CAD offers radiologists which of the following?

- A. diagnosis
- B. treatment option
- C. double read
- D. none of the above

50. Basic CAD systems consist of a workstation with display and _____ .

- A. signal processing software
- B. x ray film processor
- C. kVp selector
- D. mAs selector

51. The CAD units highlights which of the following areas of concerns for radiologist's review?

- A. masses
- B. calcifications
- C. architectural distortions
- D. All of the above

52. Which of the following CAD devices approved by FDA?

- A. ImageChecker M1000®
- B. Second Look®
- C. MammoReader®
- D. All of the above

53. According to 2001 study, using both conventional mammography reading techniques as well as CAD technology, radiologists found nearly _____ more cancers with CAD than they did without.

- A. 5%
- B. 20%
- C. 40%
- D. 60%

54. Which of the following specialist are the most often the targets of litigation because of missed breast cancer diagnosis?

- A. Cardiologist
- B. Urologists
- C. Radiologists
- D. Ophthalmologists

55. In 1991, the FDA cleared _____ for use as a diagnostic tool to evaluate breast tissue abnormalities found in other exams but **not** as a screening tool.

- A. MRI
- B. mammography
- C. PET
- D. none of the above

56. MRI is useful in a number of clinical indications such as finding _____ that are sometimes missed in mammograms.

- A. large breast lesions
- B. breast implants
- C. small breast lesions
- D. none of the above

57. MRI is better at which of the following?

- A. generating better images of dense augmented breast tissue
- B. revealing multifocality of breast cancer
- C. aiding in treatment staging and follow-up
- D. all of the above

58. Which of the following is the primary modality for detecting ductal carcinoma in situ (DCIS)?

- A. MRI
- B. mammography
- C. Ultrasound
- D. CT

59. _____ might help detect otherwise occult foci (such as those that occur in DCIS), or in patients with small or dense breasts for whom mammography can be less reliable.

- A. CT
- B. Ultrasound
- C. contrast enhanced MRI
- D. digital mammography

60. Which of the following contrast is used to provide better soft-tissue contrast and differentiate cancer from benign surrounding tissue in MRI?

- A. gadolinium
- B. barium
- C. gastrografin
- D. iodine

61. In figure 3-5, which image represent MRI mammogram?

- A. right
- B. left

62. In MRI, when compared to benign breast lesions, cancerous lesions tend to absorb the contrast agent _____ and the gadolinium-based agents are washed out _____.

- A. slower, faster
- B. faster, slower
- C. slower, slower
- D. faster, faster

63. Since the techniques for performing and interpreting breast MRI are not standardized, breast MRI performance has been variable, and it has been challenging to determine its clinical efficacy.

- A. TRUE
- B. FALSE

64. How much breast MRI cost?

- A. less than conventional mammography
- B. about 10 times the cost of conventional mammography
- C. about 50 times the cost of conventional mammography
- D. about 80 times the cost of conventional mammography

65. Ultrasound gained FDA approval in _____ as a means to evaluate suspicious mammography findings.

- A. 1970
- B. 1972
- C. 1977
- D. 1980

66. Which of the following is the **main** reason for mammography facility closures?

- A. financial factors
- B. patients
- C. radiologists
- D. none of the above

67. The ACR and the American Society of Radiological Technologists (ASRT) have jointly defined a new physician extender with expertise in medical imaging called _____

- A. PACS Administrator
- B. Radiation Therapist
- C. Radiological Associate or Radiologist Assistant(RA)
- D. Radiation Officer

68. Who surveys mammography equipment and oversees quality assurance practices?

- A. Medical Physicist
- B. Radiologic Technologist
- C. Interpreting Physician
- D. none of the above

69. According to the requirements set by the FDA in the Code of Federal Regulations for Mammography, Radiologic Technologist **must** perform _____ mammograms every 2 years.

- A. 100
- B. 200
- C. 400
- D. 500

Chapter 4

70. A _____ compares the risk of disease among people with a particular risk factor to the risk among people without that risk factor.

- A. genetic risk
- B. inherited risk
- C. absolute risk
- D. relative risk

71. According to table 4-1 what is the probability of developing breast cancer for women on their 50s in the next 10 years?

- A. 0.40%
- B. 1.45%
- C. 2.78%
- D. 4.31%

72. Approximately what percentage of women who develop breast cancer have *the type of cancer called hormone receptor positive*?

- A. 15
- B. 20
- C. 50
- D. 70

73. In order for a breast cell to become cancerous, it must accumulate a _____ of molecular changes that alter key genes or their functions.

- A. critical mass
- B. fluid cyst
- C. pus collection
- D. none of the above

74. Which of the following gene/s is/are responsible for breast cancer?

- A. BRCA1
- B. BRCA2
- C. BRCA3
- D. A and B only

75. The subtle DNA changes, known as _____ determine breast cancer susceptibility.

- A. BRCA4
- B. polymorphisms
- C. BRCA3
- D. BRCA5

76. According to the report, **most** screening guidelines recommend _____ mammograms for every woman over 50.

- A. every 6 months
- B. every two years
- C. annual
- D. every five years

77. Male breast cancer can occur, but too rarely to screen with Mammography.

- A. TRUE
- B. FALSE

Chapter 5

78. Which of the following are biologically based technologies that hold the promise of revolutionizing breast cancer detection and management?

- A. cancer biomarkers
- B. molecular profiles
- C. molecular imaging
- D. all of the above

79. A _____ is an objectively measurable characteristic that can be evaluated as an indicator of normal biological processes, disease, or response to therapeutic intervention.

- A. symptoms
- B. biomarker
- C. polymorphism
- D. none of the above

80. Which of the following paths are used to search for cancer biomarkers?

- A. hypothesis-driven
- B. discovery-based
- C. family history based
- D. A and B only

81. Biomarker testing may complement _____ in breast cancer detection.

- A. CT
- B. Sonography
- C. mammography
- D. none of the above

82. Which of the following can elevate its level in breast cancer tissue and may be involved in metastasis?

- A. CA 15-3 protein
- B. BRCA3
- C. BRCA4
- D. BRCA5

83. Which of the following was founded in 2000 to facilitate biomarker discovery and validation through the collaboration among government, academia, and industry?

- A. MQSA
- B. Early Detection Research Network (EDRN)
- C. FDA
- D. ACR

84. EDRN consists of which of the following components?

- A. Clinical Epidemiological Centers
- B. Biomarker Validation Laboratories
- C. Biomarker Discovery Laboratories
- D. all of the above

85. The guiding Principle, Preclinical exploratory used in biomarker validation is part of which of the following phases?

- A. Phase 1
- B. Phase 2
- C. Phase 3
- D. Phase 4

86. Which of the following act protects patient confidentiality?

- A. MQSA
- B. Health Insurance Portability and Accountability Act (HIPAA)
- C. FDA
- D. Early Detection Research Network (EDRN)

87. Which of the following can serve as cancer biomarker/s among cancer candidates?

- A. Genomics
- B. Proteomics
- C. mammogram
- D. A and B only

88. Which of the following techniques can detect and map cancer-related changes in DNA copy number?

- A. CGH
- B. RNA
- C. PCR
- D. none of the above

89. The genetic mutations can disrupt control of cellular functions by doing what?

- A. Alterations in gene copy number
- B. Post-translational processing
- C. Phosphorylation
- D. all of the above

90. The blood serum accumulates which of the following from body tissues?

- A. Proteins
- B. protein fragments
- C. metabolites
- D. all of the above

91. What does Molecular imaging do in breast cancer?

- A. In vivo measurement
- B. biological process characterization
- C. biological process quantification
- D. all of the above

92. Which of the following are considered molecular imaging modalities?

- A. PET and SPECT
- B. Optical imaging and fluorescence
- C. MRI, CT and Sonography
- D. all of the above

93. MRI is used to detect breast cancer because it offers what?

- A. higher spatial resolution
- B. simultaneous depiction of molecular information
- C. simultaneous depiction of anatomical information
- D. all of the above

94. MRI uses which of the following to scan objects?

- A. x-rays
- B. gamma rays
- C. radiowaves
- D. soundwaves

Chapter 6

95. In United States, a research technology must pass _____ review for safety and effectiveness before it can be marketed.

- A. MQSA
- B. EDRN
- C. FDA
- D. ACR

96. What is the last step in pathways of medical technology development?

- A. widespread clinical use
- B. FDA approval
- C. investigation
- D. discovery

97. With the **possible exception** of AIDS, _____ research receives more funding than any other disease in the US.

- A. prostate cancer
- B. breast cancer
- C. colon cancer
- D. ovarian cancer

98. Which of the following state government is one of the major funders of breast cancer research?

- A. Washington DC.
- B. Florida
- C. California
- D. Texas

99. Which of the following are common causes of failures in clinical trial designs?

- A. Poorly Described Patient Populations and Techniques
- B. Bias and Too Narrow a Patient Population
- C. Inappropriate Statistical Analysis and Planning
- D. all of the above

100. There are three major measures of cancer status in a population: incidence, survival, and mortality.

- A. TRUE
- B. FALSE

101. _____ curves are used to illustrate the effects of different factors on breast cancer survival.

- A. H & D
- B. Kaplan-Meier
- C. Threshold
- D. Non-threshold

102. Which of the following techniques complement conventional mammography in breast cancer screening?

- A. Digital mammography
- B. Magnetic Resonance Imaging (MRI)
- C. Computer-Assisted Detection (CAD)
- D. all of the above

103. Which of the following is a comparison of digital mammography with film mammography?

- A. Digital Mammography Imaging Screening Trial (DMIST)
- B. American College of Radiology Imaging Network (ACRIN)
- C. Early Detection Research Network (EDRN)
- D. None of the above

104. _____ is the first biologic therapy ever approved for the treatment of breast cancer.

- A. Zestril®
- B. Herceptin®
- C. Prinivil®
- D. Lotrel®

105. Digital imaging technology increases opportunities for which of the following?

- A. electronic sharing of images
- B. electronic sharing of data
- C. information among a wide network of clinicians and researchers
- D. all of the above

106. Which of the following can store digital images from MRI, Ultrasound and other digital modalities?

- A. pdf files
- B. film storage archive
- C. National Digital Mammography Archive
- D. none of the above

Chapter 7

107. Which of the following is a proper term for the likelihood that a particular intervention will benefit patients when used under optimal or ideal experimental conditions?

- A. Efficacy
- B. Effectiveness
- C. intervention
- D. results

108. Which of the following is/are phase/s of technology adoption?

- A. Technology assessment
- B. Technology deployment
- C. Technology monitoring
- D. all of the above

109. Which of the following creates a breast map with a small electrical current without compression?

- A. MRI
- B. T-Scan
- C. Optical imaging
- D. Digital mammography

110. Most insurance companies now cover BRCA testing for breast cancer, but _____ is not covered for screening.

- A. CAD
- B. Magnetic Resonance Imaging (MRI)
- C. Conventional mammography
- D. none of the above

111. Many of the important new technologies in breast cancer detection and diagnosis rely on improvements in information handling, and therefore have significant implications for organizational structure.

- A. TRUE
- B. FALSE

112. Which of the following project illustrated the value of attention to organization for patients benefits?

- A. The California Mammography Project
- B. The Florida Mammography Project
- C. The Colorado Mammography Project
- D. The Texas Mammography Project

Chapter 8

113. According to the recommendation in the article, health care providers and payers should consider adopting elements of successful breast cancer screening programs from other countries.

- A. TRUE
- B. FALSE

114. Who should be enlisted to prescreen or double-read mammograms for abnormalities to expand the capacity of breast imaging specialists?

- A. primary care physicians
- B. radiologist
- C. trained non-physician personnel
- D. none of the above

115. Which of the following should be integrated to develop new screening strategies for breast cancer?

- A. biology
- B. technology
- C. risk models
- D. all of the above

116. Professional societies should work together with women's health organizations to identify barriers to participation in studies and ways in which those barriers might be overcome.

- A. TRUE
- B. FALSE

Appendix

117. Which of the following modality provides mammograms that are taken taken at several angles to provide high resolution cross-sections and three-dimensional images?

- A. CAD
- B. Tomosynthesis
- C. Screen-Film mammography
- D. Diffraction Enhanced Imaging

118. Screen-Film Mammography is also known as Conventional X-Ray Mammography.

- A. TRUE
- B. FALSE

119. _____ be stored and retrieved electronically, making remote consultations with other mammography specialists possible/easier and lost mammogram films less likely.

- A. Digital mammography
- B. FFDM
- C. Conventional mammography
- D. Both A and B

120. Which of the following modality is used when abnormalities are unclear on a mammogram, to determine the extent of tumor growth after initial diagnosis and to evaluate the effectiveness of treatments?

- A. Digital mammography
- B. CT
- C. MRI
- D. none of the above