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Course title: Use of Ultrasound in Abdomen and Superficial Structures
Test Questions

Topic: Common Pitfalls and How to Overcome

1. _____ is an imaging modality using high-frequency sound waves to recognize unique tissue characteristics.
(A): Radiography
(B): Medical ultrasound
(C): MRI
(D): Computed Tomography

2. The normal human range of audible sound is from 70 Hz to 170 KHz.
(A): True (B): False

3. Piezoelectric effect discovered by Pierre and Jacques Curie in _____ is the basic principle of ultrasound transducer.
(A): 1800
(B): 1810
(C): 1880
(D): 1900

4. Which of the following is the basic rule in ultrasound image formation?
(A): ultrasound pulse travels in a straight line
(B): velocity of the ultrasound is constant, so distance is directly proportional to how far the structure is from the transducer
(C): echo strength is related to the tissue reaction with the ultrasound waves
(D): all of the above

5. _____ is the number of the sound waves per second.
(A): Frequency
(B): Voltage
(C): Gravity
(D): Ionization

6. The frequency of transducer determines the _____ of the ultrasound image.
(A): resolution
(B): digital signal
(C): contrast
(D): none of the above

7. The resolution of the ultrasound machine is its ability to detect and display two close structures as distinct.
(A): True
(B): False

8. Preparation for regular abdominal ultrasound generally requires fasting for _____ hours, decreasing the gas in the intestine.
(A): 1
(B): 3
(C): 4
(D): 8

9. For the gall bladder and biliary tree exploration, fasting is essential for ultrasound screening.
(A): True
(B): False

10. The artifacts in ultrasound imaging arise either from an improper operator technique or the physics of ultrasound transmission and traveling.
(A): True

(B): False

11. Artifacts can be related to and classified into which of the following?
(A): beam and the resolution
(B): location and the attenuation
(C): scattered radiation
(D): both A and B

12. ____ is the ability to detect two close points in the transverse plane as two distinct points.
(A): Adenomyomatosis
(B): Lateral resolution
(C): Ring-down artifacts
(D): Accentuation

13. _____ appears as multiple bright parallel lines at regular intervals that decrease in intensity as the depth increase.
(A): Secondary lobe artifacts
(B): Beamwidth artifact
(C): Reverberation artifact
(D): Comet tail artifact

14. Comet tail artifact is useful as it considered a fingerprint for identification and diagnosis of cholesterol crystals in adenomyomatosis of the _____.
(A): pancreas
(B): spleen
(C): gallbladder
(D): stomach

15. _____ mimics disease, such as pseudo-thickened bowel wall and lesions in the lung.
(A): Ring-down artifact
(B): Mirror image artifact
(C): Reverberation artifact
(D): None of the above

16. _____ is a loss of ultrasound energy and amplitude as it goes deeper through the tissue.
(A): Attenuation
(B): Backscatter
(C): Anode heel effect
(D): Inverse square law

17. The edge artifact occurs in rounded structures like a cyst or urinary bladder as the ultrasound refracted at its edges results in shadows at both edges.
(A): True
(B): False

18. The liver is located in the _____ of the abdomen.
(A): left upper quadrant
(B): left lower quadrant
(C): right upper quadrant
(D): right lower quadrant

19. Which of the following outline should be included in abdominal ultrasound report?
(A): architectures
(B): echogenicity of the parenchyma
(C): blood vessel distribution with a special comment on its variation from normal
(D): all of the above

Topic: The Influence of Ultrasound Equipment Knobology in Abdominal Sonography
20. _____ is a terminology that describes the manipulation of ultrasound knobs and system controls in order to obtain the best image possible from diagnostic ultrasound.
(A): Radiology
(B): Knobology

(C): Pharmacology
(D): Pathology

21. In abdominal sonography, selecting the appropriate application preset for abdominal examination is first step towards achieving an optimum image.
(A): True
(B): False

22. Ultrasound imaging is used in assessing which of the following?
(A): obstetrics and gynecology
(B): cardiac and vascular examinations
(C): breast, thyroid, and musculoskeletal
(D): all of the above

23. Ultrasound images are produced from high frequency sound waves that are emitted by the _____, typically in the range of 1–15 MHz.
(A): x-ray tube
(B): radiation detectors
(C): transducer
(D): radio coils

24. In selecting a frequency for an abdominal examination, the operator should consider the _____ of the patient.
(A): age
(B): size
(C): gender
(D): none of the above

25. In neonates and children, a lower frequency is highly useful, as this is likely to produce better image resolution to shorten the duration of the examination in fulfillment of ALARA principles.
(A): True
(B): False

26. With the _____, image quality can be improved by adjusting the brightness of the entire field of view without increasing the intensity of transmitted sound energy.
(A): overall gain
(B): magnification
(C): anode heel effect
(D): line focus principle

27. During scanning, the system allows the operator to improve lateral resolution in a region of interest by adjusting the _____.
(A): collimator
(B): target angle
(C): focal zone
(D): kVp

28. The _____ is used for magnifying the area of interest.
(A): field of view
(B): region of interest
(C): zoom
(D): none of the above

29. The _____ is a control on the ultrasound system that allows the operator to determine the range of shades of gray to be displayed on the monitor.
(A): special resolution
(B): grayscale window
(C): contrast resolution level
(D): dynamic range

30. In abdominal sonography, a broad dynamic range is the most appropriate option for assessing the echotexture of homogeneous soft-tissue structures like the liver, pancreas, and spleen. (A): True

(B): False

31. ____ improves image quality by eliminating weak echoes that cloud the image when the fundamental frequency of the transducer is used.
(A): Dynamic range
(B): Tissue harmonic Imaging (THI)
(C): READ zoom
(D): none of the above

32. Which of the fundamental knob influences both color and spectral doppler imaging?
(A): Doppler gain
(B): Pulse repetition period (PRF)
(C): Wall filter
(D): all of the above

Topic: Liver Ultrasound Abnormalities in Alcohol Use Disorder
33. Alcohol-related liver disease is the most common alcohol-related medical illness, and it is the major driver of liver-related deaths worldwide.
(A): True
(B): False

34. Which of the following liver diseases in patients with alcohol use disorder (AUD) encompass a spectrum of histological abnormalities?
(A): steatosis and fibrosis
(B): steatohepatitis
(C): cirrhosis of the liver and hepatocellular carcinoma
(D): all of the above

35. Nearly _____% of patients with liver disease present for the first time with a nonelective hospital admission due to end-stage liver disease.
(A): 25
(B): 48
(C): 75
(D): 99

36. The Alcohol Use Disorders Identification Test (AUDIT) is a validated tool for identifying AUD in patients.
(A): True
(B): False

37. Abdominal ultrasound is an accurate method for estimating liver size, which should be determined at the midclavicular line and in normal conditions is less than ____ cm.
(A): 5
(B): 7
(C): 10.5
(D): 16

38. The hepatic veins, which drain in the _____, have thinner walls in comparison to the portal vein.
(A): aorta
(B): superior vena cava
(C): inferior vena cava
(D): femoral artery

39. Abdominal ultrasound is a reliable method for a first-line evaluation of portal vein abnormalities suggestive of portal hypertension.
(A): True
(B): False

40. _____ should be used to document blood flow characteristics and blood flow direction, which is crucial in the diagnosis of portal hypertension.
(A): Radionuclides
(B): Doppler evaluation
(C): Contrast media

(D): None of the above

41. In abdominal ultrasounds, liver steatosis appears as hypo-echogenicity due to the decreased parenchymal reflectivity that intracellular fat accumulation produces.
(A): True
(B): False

42. The sensitivity of abdominal ultrasound to detect liver steatosis is impacted by the amount of ____ content.
(A): water
(B): calcium
(C): fat
(D): hemoglobin

43. _____ is the last stage of alcohol related liver disease, with an annual incidence of 2.9% in patients that already harbor liver cirrhosis.
(A): Fatty liver
(B): Hepatitis
(C): Hepatocellular carcinoma
(D): None of the above

44. _____ is a noninvasive tool to detect liver steatosis that measures ultrasound attenuation when trespassing fatty liver tissue.
(A): Biopsy
(B): Controlled attenuation parameter (CAP)
(C): Endoscopy
(D): None of the above

45. Abdominal ultrasound is a cheap and easily available noninvasive method that could be useful as a first-line screening to assess underlying liver disease in patients with excessive alcohol intake.
(A): True
(B): False

Topic: The Kidney
46. Ultrasound and _____ still remain the first-line radiological tools for most of the kidney disorders.
(A): MRI
(B): Nuclear Medicine
(C): Mammography
(D): Conventional Radiographs

47. The kidney is an endocrine organ that secretes which of the following hormone?
(A): erythropoietin
(B): renin
(C): prostaglandins
(D): all of the above

48. Primarily, fetal kidney derives blood supply, branches from the _____.
(A): femoral artery
(B): superior vena cava
(C): iliac artery
(D): aorta

49. The volume of the left kidney is smaller than that of the right kidney.
(A): True
(B): False

50. Before the kidney examination, the adult patients should fast for a minimum of ____ hours before the examination to avoid extensive bowel gas.
(A): 1
(B): 2
(C): 3
(D): 6

51. _____ stones constitute the majority (60%) of all renal stones.
(A): Calcium oxalate
(B): Calcium phosphate
(C): Struvite
(D): Calcium-magnesium-ammonium phosphate

52. _____ is the most common primary kidney malignancy in adults.
(A): Angiomyolipoma (AML)
(B): Acquired cystic kidney disease (ACKD)
(C): Renal cell carcinoma (RCC)
(D): None of the above

Topic: Ultrasound of the Kidneys: Application of Doppler and Elastography
53. The kidneys are examined with ultrasound in longitudinal and transverse scans planes using 3.5 and 5 MHz transducers.
(A): True
(B): False

54. Which of the following type of Doppler sonography is available today in medical imaging?
(A): Color Doppler
(B): Power Doppler
(C): Pulse wave Doppler
(D): all of the above

55. Pulsed wave Doppler (PWD) ultrasound is used to generate a sonogram of a _____ under study.
(A): bone
(B): blood vessel
(C): muscle
(D): joint

56. Doppler ultrasound assesses patterns of renal and extrarenal vascularization.
(A): True
(B): False

Topic: Ultrasound Modality in the Evaluation and Management of Gallbladder Polyps
57. _____ is the main and the first line radiological modality for Gallbladder polyps (GBP) diagnosis and their risk lamination.
(A): MRI
(B): Computed Tomography
(C): Abdominal ultrasound
(D): Nuclear Medicine

58. Ultrasound diagnosis of GBP is founded on which of the following criteria?
(A): lack of posterior acoustic shadow
(B): immobility when changing the patient's position
(C): fatty liver
(D): Both A and B

59. Gallbladder polyps are potentially malignant lesions so that it is mandatory to be precise whether the polyp is a high or low risk of malignancy and to lead undoubtedly to their perfect management.
(A): True
(B): False

60. Which of the following is a low-cost modality for the diagnosis of Gallbladder polyps?
(A): PET/CT
(B): Ultrasound
(C): Molecular MRI
(D): none of the above

61. According to the 12 year retrospective study of gallbladder polyps the surgical indication was retained especially when there were symptomatic polyps whatever the size, which was in ____% of cases.

(A): 35.5
(B): 50.1
(C): 67.6
(D): 100

62. Which of the following is a useful contrast agent in ultrasound to identify gallbladder polyps of multiple stones and from other polypoid lesions?
(A): Microbubbles
(B): Gadolinium
(C): Iodine 350
(D): Radionuclide

Topic: Ultrasonography of the Stomach
63. Ultrasound is a versatile imaging modality with the potential to provide much quantitative and qualitative information in both clinical and research settings.
(A): True
(B): False

64. Ultrasound was introduced in the early _____.
(A): 1960s
(B): 1980s
(C): 1990s
(D): none of the above

65. Fasting for a period of time prior to the ultrasound examination will minimize the fluid and air present in the stomach and small intestine, resulting in poor quality images.
(A): True
(B): False

66. The measurement of gastric emptying (with both 2D and 3D ultrasound) should be performed in _____ position.
(A): prone
(B): supine
(C): seated or semi recumbent
(D): none of the above

67. Which of the following is a function of the proximal stomach?
(A): digestion of the food
(B): elimination of the food
(C): absorption of the food
(D): storage facility to accommodate food

68. Images should be taken at the end of inspiration to minimize the effects of the normal motion of the stomach which occurs with regular breathing.
(A): True
(B): False

69. The ability to assess gastric distension is of particular relevance in patients with _____ and _____ in whom the prevalence of upper gastrointestinal symptoms is substantial.
(A): migraine, meningitis
(B): diabetes mellitus, functional dyspepsia
(C): anemia, hepatitis
(D): none of the above

70. Ultrasonographic imaging of the proximal stomach was first described in _____.
(A): 1900
(B): 1950
(C): 1995
(D): 2009

71. The use of which of the following is currently, the ‘gold standard’ for assessment of proximal stomach accommodation?

(A): barostat device
(B): endoscope procedure
(C): gastric tube insertion
(D): none of the above

72. Which of the following has the capacity to non-invasively provide information about gastric volume without interfering with gastric motor patterns?
(A): Digital radiography
(B): Scintigraphic single photon emission computed tomography (SPECT)
(C): Upper endoscopy
(D): none of the above

73. Scintigraphy is currently the 'gold standard' for clinical measurement of gastric emptying.
(A): True
(B): False

74. Ultrasonography can be used to both quantify and qualify the movement of the contents of the stomach across the pylorus, into the _____.
(A): small intestine
(B): large intestine
(C): rectum
(D): duodenum

75. Gastric strain rate imaging (SRI) involves the recording of _____ to obtain strain, and the strain rate is defined by the gradient of the velocity component of two points along the ultrasound beam.
(A): blood flow
(B): acid reflux
(C): tissue velocity
(D): gas movement

76. Ultrasonography offers several advantages over other imaging modalities in that it is easy to perform, readily accessible, cheap, and not associated with a radiation burden.
(A): True
(B): False

Topic: Anatomy, Sonographic Features, and Dimensional Variations of Spleen among Individuals with Different Sociodemographic and Anthropometric Measurement
77. Due to the lack of attention in clinical practice, _____ has become quite a common problem in all parts of the world.
(A): spleen cancer
(B): splenomegaly
(C): Hodgkin's disease
(D): myeloproliferative neoplasms

78. The detection of the spleen by palpation is not approval of enlarged spleen because normal spleen may be palpable.
(A): True
(B): False

79. The spleen is the largest lymphoid soft organ that lies in the left hypochondrium between the fundus of the stomach and the _____.
(A): cardiac notch
(B): right kidney
(C): diaphragm
(D): liver

80. The _____ of the spleen functions as a blood filter that removes foreign material and damaged erythrocytes.
(A): white pulp
(B): red pulp
(C): gray pulp
(D): none of the above

81. The spleen is involved and enlarged in a variety of clinical conditions and its size is mostly affected by which of the following factors?
(A): infections and hematological disorders
(B): infiltrative states
(C): immunological and malignant diseases
(D): all of the above

82. Splenic atrophy is also another common problem seen in diseases like sickle cell anemia, where progressive atrophy as a result of repeated attacks of vaso-occlusion and infarction caused by these diseases leads to auto splenectomy.
(A): True
(B): False

83. What is an average weight of a spleen in adult human?
(A): 150–200 g
(B): 300–370 g
(C): 400–557 g
(D): 600–700 g

84. Spleen length is the maximum distance measured in longitudinal plane at hilum between the dome of the spleen and the _____.
(A): celiac trunk
(B): diaphragm
(C): left kidney
(D): splenic tip

85. _____ is the maximum dimension measured in a plane perpendicular to the length at hilum between the medial and lateral borders of the spleen.
(A): Spleen length
(B): Spleen thickness
(C): Spleen width
(D): Spleen volume

Topic: Prostate
86. _____ imaging is currently an integral part of prostate cancer diagnosis and treatment procedures, providing high-resolution anatomical detail of the prostate region.
(A): Colonoscopy
(B): Transrectal ultrasound (TRUS)
(C): Digital radiography
(D): Barium enema

87. The prostate of an adult man measures ____ g in weight.
(A): 20-25
(B): 30-35
(C): 40-48
(D): 50-59

88. The base of the prostate is directed superiorly and in contact with the pubic symphysis.
(A): True
(B): False

89. Which of the following factor has made ultrasound imaging one of the most useful modalities in evaluation of the prostate?
(A): portability
(B): low cost
(C): lack of risks of iodinated contrast media and ionizing radiation
(D): all of the above

90. Transabdominal US of the prostate is nearly universally available and provides excellent anatomic information using the urine-filled bladder as an acoustic window.
(A): True
(B): False

91. In the axial plane, scanning usually begins at a level just above the _____ and by sequential withdrawing of the transducer in a caudal direction, the base, mid gland and the apex is visualized.
(A): kidneys
(B): descending colon
(C): seminal vesicles
(D): appendix

92. The normal prostate will appear hyperechoic to the seminal vesicles and will have a _____ echo pattern.
(A): heterogenous
(B): bright
(C): homogenous
(D): blurred

93. Cysts of the prostate are confusing abnormalities because they are uncommon, and their origin is uncertain.
(A): True
(B): False

94. _____ is an acute bacterial inflammation of the prostate.
(A): Nephritis
(B): Hepatitis
(C): Prostate cancer
(D): Acute prostatitis

95. Which of the following are sonographic findings of chronic prostatitis?
(A): high density and mid-range echoes
(B): echo-lucent zones and ejaculatory duct calcifications
(C): capsular/ periurethral zone irregularity and capsular thickening
(D): all of the above

96. Primary prostatic calculi develop in the prostatic ducts and acini.
(A): True
(B): False

97. _____ is the primary imaging modality for evaluation of the aging men with known or suspected benign prostatic hyperplasia (BPH).
(A): Digital radiography
(B): Ultrasound
(C): MRI
(D): Nuclear Medicine

98. _____ is now the second most common cancer in men.
(A): Lung cancer
(B): Thyroid malignancy
(C): Carcinoma of the prostate
(D): Colon cancer

99. The hypoechoic tumors represent _____% of prostate tumors.
(A): 10-15
(B): 20-35
(C): 40-55
(D): 70-75

100. The most important role for Transrectal ultrasound (TRUS) is to provide visual guidance for biopsy.
(A): True
(B): False

101. Transperineal approach is the first way described for US-guided prostate biopsy in _____.
(A): 1975
(B): 1981
(C): 1990
(D): 2000

102. Which of the following techniques has dramatically improved the role of ultrasound for prostate cancer detection?
(A): use of 3D in color
(B): use of power Doppler
(C): use of contrast agents and elastography
(D): all of the above

103. Cancerous tissue generally grows more slowly than normal tissue and demonstrates decreased blood flow.
(A): True
(B): False

104. _____ is tissue ablation by local induction of extremely cold temperatures.
(A): Radiation therapy
(B): Chemotherapy
(C): Cryotherapy
(D): none of the above

Topic: Sonography of the Scrotum
105. A high resolution, near-focused, linear array transducer with a frequency of _____ MHz or greater is often used because it provides increased resolutions of the scrotal contents.
(A): 1.5
(B): 2.7
(C): 4.5
(D): 7.5

106. In ultrasound imaging, the normal testis has a homogeneous, medium-level, granular echotexture.
(A): True
(B): False

107. The epididymis is located _____ to the testis and measures 6-7 cm in length.
(A): inferior
(B): anterior
(C): posterolateral
(D): superior

108. Approximately ____% of malignant testicular tumors are germ cell tumors, of which seminoma is the most common.
(A): 35
(B): 55
(C): 68
(D): 95

109. Embryonal cell carcinomas, a more aggressive tumor than seminoma usually occurs in men in their ____s.
(A): 30
(B): 60
(C): 80
(D): 90

110. In ultrasound imaging, tuberculous epididymitis is characterized by an enlarged epididymis with variable echogenicity.
(A): True
(B): False

Topic: Clinical Perspectives of Scrotal Ultrasound in Urology
111. Which of the following scrotal and testicular emergencies that require surgical attention?
(A): Testicular torsion
(B): Acute epididymitis, orchitis, and epididymo-orchitis
(C): Testicular trauma and Fournier's gangrene
(D): all of the above

112. Color Doppler scans are required to diagnose _____ abnormalities, such as varicoceles, or more importantly, testicular torsion.
(A): muscular
(B): vascular
(C): genetic
(D): tendon

113. Testicular torsion, or more precisely, torsion of the spermatic cord, is a true urological emergency.
(A): True (B): False

114. Which of the following is one of the most common urological disorders in males?
(A): Urinary bladder cancer
(B): Kidney stones
(C): Acute epididymitis or epididymo-orchitis
(D): Nephritis

115. A spermatocele is a benign cystic lesion that contains _____.
(A): blood
(B): pus
(C): calcification
(D): sperm

Topic: The Accuracy of Ultrasound in the Pre-Operative Localization of Parathyroid Lesions in Primary Hyperparathyroidism: A Review of the Literature
116. Parathyroid ultrasound (US) has emerged as an alternative or complementary localization procedure to _____ techniques because it does not use ionizing radiation or an injection to the patient.
(A): Acupuncture
(B): Nuclear Medicine (NM)
(C): MRI
(D): Chemotherapy

117. The ultrasound equipment and sonographer expertise and protocols also have the potential to influence the accuracy of the ultrasound examination.
(A): True (B): False

118. The size of diseased glands may be very small and therefore the successful localization of very small structures with ultrasound imaging may be constrained by the _____ of the ultrasound system.
(A): cost
(B): availability
(C): resolution
(D): none of the above

Topic: Thyroid Sonography in 3D with Emphasis on Perfusion
119. The term echo in ultrasound refers to the persistence of _____ after its source has stopped.
(A): sound
(B): radiation activity
(C): magnetic waves
(D): none of the above

120. The first clinical applications of ultrasound are credited to the Austrian neurologist _____.
(A): Wilhelm Conrad Roentgen
(B): Karl Theo Dussik
(C): Godfrey Hounsfield
(D): Raymond Damadian

121. In which year the first images of 3D scanning began?
(A): 1900
(B): 1959
(C): 1970
(D): 1987