

Purchase Course: [Computed Tomography Review ARRT 19 CE Credits](#)

Give Online Test: [Click here](#) (check your email for test access ecode)

Test Questions

Chapter 1

1. Candidate who wish to obtain a certification in computed tomography (CT) must hold a registration in which one of the following supporting categories?

- A. Radiography
- B. Nuclear Medicine Technology
- C. Radiation Therapy
- D. Any one of the above

2. Minimum of how many hours of structured education credits required in topics that reflect the CT certification examination content?

- A. 16
- B. 24
- C. 32
- D. 60

3. The American Registry of Radiologic Technologists (ARRT) post-primary examination in CT was first offered in March _____.

- A. 1970
- B. 1985
- C. 1995
- D. 2007

Chapter 2

4. Proper documentation of which of the following can greatly assist the interpreting physician in the diagnostic process of a patient?

- A. patient's recent procedures, surgeries, and symptoms
- B. possible trauma in patient
- C. specific areas of pain or discomfort in patient
- D. all of the above

5. Communication is the key to any successful patient interaction.

- A. TRUE
- B. FALSE

6. Which of the following high-density or metallic items should be removed from a patient when necessary and appropriate during CT scanning?

- A. jewelry
- B. hair fasteners
- C. electronic devices
- D. all of the above

7. A _____ **must** sign the informed consent form for a minor.

- A. technologist
- B. parent or legal guardian
- C. radiologist
- D. nurse

8. Which of the following can cause substantial image degradation during CT examination?

- A. contrast injection
- B. patient motion
- C. gantry/table
- D. none of the above

9. Which of the following are considered as vital signs?
- A. temperature
 - B. pulse & blood pressure
 - C. respirations
 - D. all of the above
10. Systolic blood pressure indicates the pressure within arteries during cardiac contraction and should be less than _____ mm Hg.
- A. 120
 - B. 90
 - C. 85
 - D. 70
11. A _____ is an electronic device used to measure pulse and respiratory status.
- A. ionization chamber
 - B. otoscope
 - C. pulse oximeter
 - D. chest x-ray
12. Which of the following is a graphic representation of the electrical activity of the heart?
- A. H & D curve
 - B. An electrocardiogram (ECG)
 - C. The cardiac cycle
 - D. Mammogram
13. The cardiac cycle can be divided into which of the following distinct stages?
- A. Atrial systole
 - B. Ventricular systole
 - C. Complete cardiac diastole
 - D. all of the above
14. _____ refers to an insufficient oxygenation of tissue at the cellular level.
- A. Hypoxia
 - B. Asthma
 - C. Epilation
 - D. Migraine
15. Oxygen is considered a drug, and it is typically administered under the order of a physician.
- A. TRUE
 - B. FALSE
16. A _____ can be used to drain fluid from the intrapleural space of the ill or injured patient.
- A. pulse oximeter
 - B. otoscope
 - C. thoracostomy tube (chest tube)
 - D. naso-gastric tube
17. CT technologist **must** take care to ensure that the urine drainage bag be kept below the patient's bladder at all times to prevent the _____ of urine when imaging a patient with an in-dwelling catheter.
- A. darkening
 - B. clotting
 - C. back-flow (reflux)
 - D. none of the above
18. Blood urea nitrogen (BUN) and creatinine level are lab values used to indicate _____.
- A. cardiac function
 - B. renal function
 - C. lung function
 - D. thyroid function

19. _____ medications may be prescribed to reduce patient anxiety during a CT examination.
- A. Anxiolytic
 - B. Asthma
 - C. Antihistamine
 - D. Diuretic
20. Which of the following radiopaque contrast media (RCM) is typically used for CT examinations?
- A. iodine
 - B. barium
 - C. gadolinium
 - D. both A and B
21. Which of the following can be used as negative contrast agents during CT examination?
- A. air
 - B. gases
 - C. water
 - D. all of the above
22. Which of the following are contraindications to IV iodinated contrast agents?
- A. Allergy to iodine
 - B. History of allergic reaction to an iodinated contrast agent
 - C. Renal insufficiency or failure
 - D. all of the above
23. Intravascular RCM are generally administered in doses ranging from _____ ml.
- A. 1 to 10
 - B. 10 to 20
 - C. 20 to 35
 - D. 50 to 150

Chapter 3

24. _____ is defined as the reduction of intensity of a radiation beam as it passes through a substance.
- A. Scattered radiation
 - B. Pair production
 - C. Attenuation
 - D. Radio activity
25. Overall, an attenuation of the CT x-ray beam depends on which of the following factors?
- A. beam quality (photon energy)
 - B. atomic density of the imaged tissue
 - C. magnet size
 - D. both A and B
26. The focus-to-detector distance is the distance between the x-ray source (CT tube) and _____.
- A. CT table
 - B. detector array
 - C. control booth
 - D. power injector
27. The spatial arrangement of CT detector elements, including the amount of inter-space material required between adjacent elements is called _____.
- A. window width
 - B. 3D reconstruction
 - C. geometric efficiency of a detector array
 - D. minification
28. An overbeaming in Computed Tomography is known as _____ process.
- A. penumbra

- B. subtraction
- C. 3D
- D. windowing

29. Radiation protection in CT should follow which of the following concept?

- A. ALARA (as low as reasonably achievable)
- B. Inverse square law
- C. Planck's constant
- D. none of the above

30. Which of the following general radiation protection principles should apply in CT?

- A. Strict clinical indication
- B. Protocol optimization
- C. Shielding
- D. all of the above

31. During CT data acquisition, the section of the patient exposed to radiation may be referred to as the ____.

- A. lab results
- B. dose profile
- C. insurance data
- D. patient profile

32. Image noise is directly related to _____.

- A. window width
- B. 3D reconstruction
- C. patient size
- D. contrast media

33. To maximize dose reduction, lead shielding must be applied both above and below the patient to account for the rotational nature of the exposure in CT.

- A. TRUE
- B. FALSE

34. _____ describes the amount of radiation absorbed in a quantity of air.

- A. Magnification
- B. Air kerma
- C. Ionization
- D. Attenuation

35. _____ is an approximate measure of the dose received in a single CT section or a slice.

- A. window width
- B. 3D reconstruction
- C. CT dose index (CTDI)
- D. flux gain

36. Which of the following are current industry standards requirements apply to CT systems for dose reduction techniques?

- A. Automated CT dose check & AEC
- B. Adult and pediatric reference protocols
- C. DICOM Radiation Dose Structured Reporting
- D. all of the above

37. Which of the following are recommendations for the reduction of pediatric dose in CT?

- A. Elimination of CT scans for inappropriate indication
- B. Reduction of multi-phase scanning, mA & kVp
- C. Increasing pitch
- D. all of the above

38. _____ was developed by the Alliance for Radiation Safety in Pediatric Imaging and sponsored by the Society for Pediatric Radiology.
- A. Image Gently campaign
 - B. Inverse square law
 - C. Magnetic safety law
 - D. ALARA (as low as reasonably achievable)

Chapter 4

39. Axial plane computed tomography (CT) images for brain are acquired parallel to _____ on a scout image.
- A. pubic symphysis
 - B. infraorbital-meatal line (IOML)
 - C. sternal notch
 - D. diaphragm
40. Non-contrast CT examinations of the brain are routinely indicated for _____ to diagnose intracranial hemorrhage or hematoma.
- A. tumors
 - B. aneurysms
 - C. trauma
 - D. sinusitis
41. CT exams of the temporal bones and internal auditory canal require a high-resolution imaging technique that contains which of the following?
- A. Thin slices
 - B. Small targeted display field of view (DFOV)
 - C. High-resolution reconstruction algorithm
 - D. all of the above
42. Direct coronal imaging perpendicular to the axial plane may be obtained with the patient in _____ position for CT sinus exams.
- A. prone
 - B. oblique
 - C. sitting
 - D. semi-erect
43. Which of the following are indications for head CT exam with contrast media?
- A. Neoplasm
 - B. Inflammatory processes
 - C. Vascular abnormalities
 - D. all of the above
44. _____ refers to the level of blood flow throughout brain tissue.
- A. Migraine
 - B. Cerebral perfusion
 - C. Stroke
 - D. Parkinson's
45. Xenon CT perfusion (Xe-CT) for brain is performed with the inhalation administration of a nonradioactive isotope of _____.
- A. xenon (Xe) gas
 - B. helium
 - C. oxygen
 - D. carbon dioxide
46. Helical axial plane CT images of the soft tissue of the neck are obtained from the superior orbital rim inferiorly through the _____.
- A. C5
 - B. Mid-sternum
 - C. lung apex

D. diaphragm

47. Slice thickness of _____ mm is adequate for **most** CT studies of the neck soft tissue.

- A. .5 to .75
- B. 1 to 1.5
- C. 3 to 5
- D. 10 to 15

48. Which of the following looks hyper-dense on CT because of its inherent iodine content?

- A. salivary gland
- B. pituitary gland
- C. adrenal gland
- D. thyroid gland

49. During chest CT exam, patient is positioned supine with the arms brought above the head to reduce artifact from the _____ area.

- A. shoulder
- B. neck
- C. abdominal
- D. pelvic

50. What is kVp setting for CT chest exam with automatically modulated exposure?

- A. 10 to 25
- B. 30 to 50
- C. 50 to 75
- D. 80 to 120

51. Which of the following are indications for contrast media administration in CT chest exam?

- A. Evaluation of the mediastinum and/or major vessels
- B. Hilar or pleural abnormalities
- C. Assessment of lymphadenopathy
- D. all of the above

52. High-resolution CT (HRCT) is used for chest exam to demonstrate diffuse lung disease.

- A. TRUE
- B. FALSE

53. _____ occurs when a blood clot breaks free from elsewhere in the venous system and migrates into a pulmonary artery.

- A. Migraine
- B. Pulmonary embolism
- C. Asthma
- D. Bronchitis

54. Cardiac CT covers which of the following clinical applications?

- A. Coronary artery calcium (CAC) quantitation
- B. Coronary CTA (CCTA)
- C. Non-coronary cardiac imaging
- D. all of the above

55. CT bronchography is a 3-D CT and can be used to visualize _____.

- A. ribs
- B. cervical spine
- C. tracheobronchial tree
- D. kidneys

56. The CT exam of the abdomen begins just above the _____ and extends through the aortic bifurcation at the general area of the iliac crest.

- A. clavicle

- B. lung apex
- C. diaphragm
- D. kidneys

57. For **general** studies of the abdomen and pelvis, ____ ml of oral contrast agent is administered 30 to 120 minutes prior to the exam.

- A. 30 to 150
- B. 750 to 1500
- C. 2000 to 2500
- D. 3000 to 4300

58. The relationship among table travel speed, detector collimation, and pitch is important in determining the amount of data gathered per gantry rotation and the overall scan time.

- A. TRUE
- B. FALSE

59. Which of the following algorithm is used for reconstruction in abdomen CT examination?

- A. bone window
- B. subtraction method
- C. standard soft tissue
- D. none of the above

60. Which of the following is benign neoplasms of the liver?

- A. Hemangioma
- B. Focal nodular hyperplasia
- C. Hepatic cysts
- D. all of the above

61. The ____ is the **second most** commonly injured abdominal organ (after the spleen) during trauma.

- A. liver
- B. kidneys
- C. bladder
- D. pubic symphysis

62. The ability of CT to demonstrate gallstones depends primarily on the ____.

- A. stone size
- B. stone composition
- C. number of stones
- D. patient's age

63. Which of the following are components of the biliary tract commonly demonstrated on CT exam?

- A. Common hepatic duct
- B. Common bile duct
- C. Intrahepatic bile ducts
- D. all of the above

64. Which of the following are typical signs of traumatic splenic injury?

- A. Hematoma
- B. Hemorrhage
- C. Laceration
- D. all of the above

65. ____ is the **primary** imaging modality for the evaluation of the adrenal glands.

- A. Nuclear Medicine
- B. Radiography
- C. Computed Tomography
- D. Sonography

66. During routine abdominal CT scanning, the adrenal glands are usually adequately imaged with slice thicknesses in the _____ range.

- A. 1- to 2-mm
- B. 3- to 5-mm
- C. 7- to 9-mm
- D. 10- to 15-mm

67. The urinary tract is consisted of which of the following?

- A. kidneys
- B. ureters
- C. bladder
- D. all of the above

68. Which of the following are parts of the gastrointestinal tract?

- A. esophagus
- B. stomach
- C. small and large intestines
- D. all of the above

69. Puncture in the wall of the GI tract is called _____.

- A. perforation
- B. fistula
- C. abscess
- D. infection

70. The acquisition speed of MDCT effectively eliminates peristaltic motion artifact and greatly improves the CT evaluation of intestinal wall pathology.

- A. TRUE
- B. FALSE

71. CT exam of the abdomen and/or pelvis is performed **predominantly** with the patient in the _____ position.

- A. oblique
- B. sitting
- C. supine
- D. tilted

72. A protrusion of the gastroesophageal junction through the diaphragm into the thorax is called _____.

- A. esophageal varices
- B. esophagitis
- C. hiatal hernia
- D. acid reflux

73. The _____ is divided proximally to distally as the duodenum, jejunum, and ileum.

- A. large intestine
- B. small intestine
- C. thorax
- D. liver

74. Which of the following helps identify the large intestine on CT cross-sectional images?

- A. anatomic location
- B. haustral markings
- C. presence of fecal matter
- D. all of the above

75. For large intestine CT exam, oral contrast agents should be administered in sufficient volume (>750 ml) and at least _____ minutes before scanning.

- A. 5
- B. 10

- C. 25
- D. 90

76. A _____ of the testes is an abnormal accumulation of fluid around a testicle.

- A. hydrocele
- B. Benign prostate hyperplasia (BPH)
- C. enterovesical fistula
- D. appendicolith

77. The uterine wall in female is divided into which of the following parts?

- A. Perimetrium
- B. Myometrium
- C. Endometrium
- D. all of the above

78. CT colonography is a primarily screening MDCT examination of the large intestine with the main goal to identify _____.

- A. esophageal varices
- B. esophagitis
- C. adenomatous polyps
- D. acid reflux

79. _____ is a specialized CT examination of the bladder in which an iodinated contrast media is directly administered under gravity into the bladder via Foley catheter.

- A. Myelography
- B. CT cystography
- C. Colonoscopy
- D. Discography

80. Which of the following imaging modality is the **primary** choice for trauma patients mainly because of its superior speed?

- A. Nuclear Medicine
- B. Radiography
- C. Computed Tomography
- D. Sonography

81. The spinal cord extends inferiorly from the brain's medulla and ends at approximately the level of _____.

- A. C7
- B. T5
- C. T7
- D. T12 to L1

82. CT of the musculoskeletal system is used to identify and characterize bony neoplasms such as cysts, benign and malignant tumors, and metastatic deposits.

- A. TRUE
- B. FALSE

83. Which of the following position allows the hand, wrist, forearm, and elbow to be scanned without superimposition with the patient's head and trunk during CT exam?

- A. decubitus
- B. superman
- C. oblique
- D. sitting

84. _____ improves visualization of the spinal cord, nerve roots, and surrounding soft tissue structures during a CT myelogram.

- A. Saline drip
- B. Barium sulfate
- C. Intrathecal administration of a contrast

D. Air

85. CT provides precise localization for which of the following interventional procedures?

- A. percutaneous biopsy
- B. abscess drainage
- C. radiofrequency ablation
- D. all of the above

86. Which of the following is a disadvantage of CT fluoroscopy for both patient and staff?

- A. added radiation dose
- B. higher workload
- C. time
- D. scheduling

87. ____ is a functional nuclear medicine study utilizing fludeoxyglucose F 18 (FDG) as a radiopharmaceutical.

- A. Radiography
- B. Ultrasound
- C. MRI
- D. Positron emission tomography (PET)

Chapter 5

88. The general process of CT imaging can be divided into which of the following steps?

- A. Data acquisition & reconstruction
- B. Multidimensional image display
- C. Image archival and communication
- D. all of the above

89. _____ acquired during a CT examination, is used as a localizer for the prescription of the subsequent cross-sectional CT acquisition(s).

- A. Spot film
- B. Scout image (the initial image)
- C. Last image hold
- D. Dynamic image

90. The CT gantry houses which of the following mechanical components of CT system?

- A. generator & x-ray tube
- B. data acquisition system (DAS)
- C. assorted collimators, slip-rings & detectors
- D. all of the above

91. _____ improves the geometric efficiency of the x-ray beam, leading to a greater spatial resolution.

- A. Tube housing
- B. Lead shielding
- C. Smaller focal spot
- D. Ionizing chamber

92. Selection of mA setting in CT depends on which of the following factors?

- A. clinical indication for the CT study
- B. patient size/density
- C. required signal-to-noise ratio (SNR) for adequate examination quality
- D. all of the above

93. _____ controls the quality of the x-ray beam and its overall penetrating capabilities.

- A. Peak kilovoltage (kVp)
- B. Milliampere-seconds (mAs)
- C. Time
- D. Shielding

94. The ____ of an x-ray tube is defined as the thickness of material that is capable of reducing the intensity of the x-ray beam to one-half of its original value.
- A. flux gain
 - B. half-value layer (HVL)
 - C. collimation shutters
 - D. cathode
95. CT collimation for MDCT can be divided into which of the following components?
- A. Beam collimation
 - B. Detector (section) collimation
 - C. Step-wedge filter
 - D. Both A and B
96. Which of the following is responsible for measuring transmitted radiation and converting it into a proportionate electronic signal to be used for image reconstruction?
- A. Tube housing
 - B. Anode
 - C. CT detector
 - D. Ionizing chamber
97. Which of the following are desired qualities of CT detectors?
- A. High efficiency
 - B. Rapid signal decay
 - C. High dynamic range
 - D. all of the above
98. All modern MDCT systems use solid-state detectors, consisting primarily of a scintillating crystal material.
- A. TRUE
 - B. FALSE
99. The first generation head-only CT system was developed by ____ in 1972 for clinical use.
- A. Nicola Tesla
 - B. Godfrey Hounsfield
 - C. Wilhelm Conrad Roentgen
 - D. Albert Einstein
100. Because of its high-speed capabilities, the primary application of Electron beam CT (EBCT) is _____.
- A. extremities scanning
 - B. IVPs
 - C. cardiac imaging
 - D. upper GI imaging
101. Which of the following are general formats of MDCT detector configuration?
- A. Uniform matrix array
 - B. Adaptive array
 - C. Hybrid array
 - D. all of the above
102. Which of the following converts the electronic signal from CT detectors into digital form?
- A. analog-to-digital converter (ADC)
 - B. signal-to-noise ratio (SNR)
 - C. step up transformer
 - D. mA meter
103. The hard disk drive is the common choice for mass storage of CT computer system data.
- A. TRUE
 - B. FALSE

104. Which of the following controls windowing, image display filters, 3-D/MPR reformation, and analytic functions (ROI, distance) applications in CT?
- A. preprocessing software
 - B. postprocessing software
 - C. laser printing
 - D. communication software
105. The quantity of radiation is controlled primarily by _____.
- A. kVp setting
 - B. focal spot size
 - C. mA selection
 - D. step-wedge filter
106. The ability of an object to attenuate the x-ray beam is assigned a value called _____.
- A. lethal dose (LD)
 - B. absorbed dose
 - C. linear attenuation coefficient (μ)
 - D. gonadal dose
107. The digital CT image is displayed on an arrangement of numerical values called _____.
- A. matrix
 - B. operating system
 - C. pixels
 - D. algorithm
108. **Most** CT systems use which of the following number pixels contained in a matrix?
- A. 10×15
 - B. 30×40
 - C. 50×100
 - D. 512×512
109. _____ is used to describe the process of grayscale mapping of the CT image.
- A. Subtraction ratio
 - B. Windowing
 - C. Cropping
 - D. communication software
110. During display of the CT image, each pixel is assigned a shade of gray on the basis of its _____.
- A. lethal dose (LD)
 - B. absorbed dose
 - C. CT number (HU)
 - D. linear attenuation coefficient (μ)
111. The **most** CT imaging systems routinely have the ability to assign up to _____ Hounsfield values to any one pixel.
- A. 500 (2^{12})
 - B. 660 (2^{12})
 - C. 870 (2^{12})
 - D. 4096 (2^{12})
112. The window width controls the contrast of a CT image, and the window level controls its _____.
- A. brightness
 - B. size
 - C. shape
 - D. algorithm
113. Because most CT examinations acquire data in the transverse, or axial plane, the most common orthogonal MPR planes are coronal and sagittal.
- A. TRUE

B. FALSE

114. Which of the following are quantitative measurements to assess the image quality of a CT system?

- A. Spatial, contrast & temporal resolution
- B. Uniformity & linearity
- C. Noise
- D. all of the above

115. Which of the following increases geometric unsharpness because of penumbra?

- A. subtraction ratio
- B. large focal spot
- C. kVp
- D. mAs

116. _____ is the ability of the CT system to detect an object with a small difference in linear attenuation coefficient as compared with the surrounding tissue.

- A. Noise
- B. Contrast resolution
- C. Penumbra
- D. MTF

117. Which of the following noise can effect/degrade the CT image?

- A. Quantum noise
- B. Electronic system noise
- C. Artifact related noise
- D. all of the above

118. As pitch increases, the speed at which the patient travels through the CT gantry decreases.

- A. TRUE
- B. FALSE

119. Which of the following are common manifestations of motion artifact on the CT image?

- A. Streaking
- B. Blurring
- C. Chemical fog
- D. both A and B

120. Web-based teleradiology systems use the geographically unlimited WAN of the World Wide Web to transmit images for physician review.

- A. TRUE
- B. FALSE