

PRACTICE EXAM 12: ARRT COMPUTED TOMOGRAPHY

(165 QUESTIONS)

This practice exam contains 165 scored-style questions aligned to the ARRT Computed Tomography content specifications effective September 1, 2026. Select the single best answer for each question. The actual ARRT examination also includes 30 unscored pilot questions. A scaled score of 75 is required to pass; manage your time across all items.

1. During patient assessment and preparation, which response best addresses this situation: before iodinated contrast, which laboratory value most directly estimates renal filtration?

- A. White blood cell count
- B. Estimated glomerular filtration rate
- C. Prothrombin time
- D. Serum hemoglobin

2. A contrast-enhanced study is being organized. The safest patient-management decision is based on this question: which infection-control action is appropriate after contact with blood?

- A. Recap a used needle with two hands
- B. Place sharps in ordinary waste
- C. Perform hand hygiene after glove removal
- D. Reuse gloves if they appear clean

3. A CT outpatient arrives for a scheduled examination. The technologist must resolve this patient-care question: a patient taking metformin is scheduled for iodinated contrast. What should guide medication instructions?

- A. Current renal function and institutional policy
- B. The selected window level
- C. The patient's height alone
- D. The number of detector rows

4. Before initiating the scan, a screening finding prompts the technologist to ask: which finding after contrast administration requires the most urgent response?

- A. Brief sensation of warmth
- B. Inspiratory stridor with respiratory distress
- C. Mild metallic taste
- D. Single episode of sneezing

5. During patient assessment and preparation, which response best addresses this situation: a patient becomes light-headed during IV placement. What should the technologist do first?

- A. Immediately begin the CT acquisition
- B. Ask the patient to stand and walk
- C. Administer additional contrast rapidly
- D. Stop, protect the patient, and assess responsiveness

6. A contrast-enhanced study is being organized. The safest patient-management decision is based on this question: which position most helps a dyspneic patient tolerate waiting before a chest CT?

- A. Standing unattended beside the table
- B. Trendelenburg without assessment
- C. Prone with the face covered
- D. Semi-upright with appropriate support

7. A CT outpatient arrives for a scheduled examination. The technologist must resolve this patient-care question: which consent is typically demonstrated when a competent patient voluntarily extends an arm for routine venipuncture after explanation?

- A. Court-ordered consent
- B. Implied consent
- C. Proxy refusal
- D. Research authorization

8. Before initiating the scan, a screening finding prompts the technologist to ask: which action is the essential purpose of a preprocedure time-out?

- A. Choose the reconstruction kernel
- B. Set the display window width
- C. Verify the correct patient, procedure, and site
- D. Archive the completed image series

9. During patient assessment and preparation, which response best addresses this situation: which finding after contrast administration requires the most urgent response?

- A. Inspiratory stridor with respiratory distress
- B. Single episode of sneezing
- C. Brief sensation of warmth
- D. Mild metallic taste

10. A contrast-enhanced study is being organized. The safest patient-management decision is based on this question: which documentation is most complete after a contrast injection?

- A. Agent, concentration, volume, route, site, rate, and response
- B. Window width and reconstruction kernel
- C. Only the scan start and stop times
- D. Only the name of the contrast agent

11. A CT outpatient arrives for a scheduled examination. The technologist must resolve this patient-care question: when selecting a peripheral vein for power injection, which site is generally preferred when suitable?

- A. A small dorsal hand vein
- B. A large antecubital vein
- C. A vein below an infiltrated site
- D. An artery at the wrist

12. Before initiating the scan, a screening finding prompts the technologist to ask: a patient reports warmth and a metallic taste during IV contrast injection but has no other symptoms. How should this be classified?

- A. A severe allergic-like reaction
- B. Contrast extravasation
- C. Expected physiologic effects
- D. Acute renal failure

13. During patient assessment and preparation, which response best addresses this situation: which step best reduces aspiration risk before a CT examination requiring oral sedation?

- A. Delay checking vital signs
- B. Increase oral contrast volume
- C. Place the patient prone
- D. Confirm required fasting status

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- B. Estimated glomerular filtration rate
- C. Prothrombin time
- D. Serum hemoglobin

16. Before initiating the scan, a screening finding prompts the technologist to ask: when selecting a peripheral vein for power injection, which site is generally preferred when suitable?

- A. An artery at the wrist
- B. A small dorsal hand vein
- C. A large antecubital vein
- D. A vein below an infiltrated site

17. During patient assessment and preparation, which response best addresses this situation: what is the first appropriate action when contrast extravasation is suspected during injection?

- A. Stop the injection immediately
- B. Continue until the scan begins
- C. Apply a tight circumferential wrap
- D. Increase the injection pressure

18. A contrast-enhanced study is being organized. The safest patient-management decision is based on this question: which practice is required before accessing an implanted venous port for power injection?

- A. Use any available butterfly needle
- B. Exceed the labeled flow limit
- C. Verify that the port and needle are power-injectable
- D. Assume every implanted port is rated

19. A CT outpatient arrives for a scheduled examination. The technologist must resolve this patient-care question: which action is the essential purpose of a preprocedure time-out?

- A. Verify the correct patient, procedure, and site
- B. Choose the reconstruction kernel
- C. Set the display window width
- D. Archive the completed image series

20. Before initiating the scan, a screening finding prompts the technologist to ask: for a patient with limited English proficiency, which communication method is most appropriate for complex consent information?

- A. An untranslated standard form
- B. A nearby minor family member
- C. Gestures without verbal explanation
- D. A qualified medical interpreter

21. During patient assessment and preparation, which response best addresses this situation: what is the first appropriate action when contrast extravasation is suspected during injection?

- A. Continue until the scan begins
- B. Stop the injection immediately
- C. Apply a tight circumferential wrap
- D. Increase the injection pressure

22. A radiation-protection review requires the technologist to determine: how is dose-length product calculated?

- A. kVp divided by rotation time
- B. CTDIvol divided by scan length
- C. CTDIvol multiplied by scan length
- D. mAs multiplied by pitch only

23. A protocol committee is reviewing radiation output. Which principle applies to this question: which CT dose index represents scanner output averaged across a standard phantom and adjusted for pitch?

- A. CTDIvol
- B. Exposure time
- C. DLP
- D. Effective dose

24. During a CT dose investigation, the technologist evaluates the following issue: what is the main dose benefit of automatic tube-current modulation?

- A. It eliminates all image noise
- B. It removes the need for centering
- C. It guarantees identical dose for every patient
- D. It adjusts current to patient attenuation

25. To optimize exposure without sacrificing the clinical objective, the team asks: for the same geometry, doubling distance from a radiation source changes intensity to approximately what fraction?

- A. One quarter
- B. Twice
- C. One half
- D. Four times

26. A radiation-protection review requires the technologist to determine: which change generally lowers CT radiation dose when other factors remain constant?

- A. Increasing tube current-time product
- B. Reducing tube current-time product
- C. Extending scan length
- D. Adding unnecessary phases

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- A. Increasing tube current-time product
- B. Adding unnecessary phases
- C. Reducing tube current-time product
- D. Extending scan length

28. During a CT dose investigation, the technologist evaluates the following issue: which action best follows ALARA during multiphase abdominal CT?

- A. Use adult technique for every child
- B. Perform only clinically justified phases
- C. Repeat every phase routinely
- D. Extend coverage beyond anatomy of interest

29. To optimize exposure without sacrificing the clinical objective, the team asks: increasing pitch above 1 in a fixed-mA helical acquisition generally has what effect?

- A. It raises dose by stopping table motion
- B. It eliminates interpolation
- C. It leaves scan speed unchanged
- D. It lowers dose by moving the table farther per rotation

30. A radiation-protection review requires the technologist to determine: which interaction is the major source of occupational scatter in diagnostic CT?

- A. Photodisintegration
- B. Compton scattering
- C. Pair production
- D. Nuclear fission

31. A protocol committee is reviewing radiation output. Which principle applies to this question: which strategy is most appropriate for pediatric CT?

- A. Tailor technique to patient size and indication
- B. Use a single adult protocol
- C. Scan the largest possible range
- D. Add phases to prevent uncertainty

32. During a CT dose investigation, the technologist evaluates the following issue: which quantity uses the unit milligray?

- A. Electrical resistance
- B. Radioactivity
- C. Absorbed dose
- D. Effective dose

33. To optimize exposure without sacrificing the clinical objective, the team asks: which CT dose index represents scanner output averaged across a standard phantom and adjusted for pitch?

- A. DLP
- B. Exposure time
- C. Effective dose
- D. CTDIvol

34. A radiation-protection review requires the technologist to determine: which protocol change most directly reduces dose from z-axis overbeaming?

- A. Archive fewer image series
- B. Use a wider window width
- C. Use appropriate detector configuration and collimation
- D. Increase display field of view

35. A protocol committee is reviewing radiation output. Which principle applies to this question: what is the primary purpose of a CT dose notification?

- A. Diagnose contrast allergy
- B. Warn before a selected dose threshold
- C. Measure patient creatinine
- D. Correct detector calibration automatically

36. During a CT dose investigation, the technologist evaluates the following issue: what is the main dose benefit of automatic tube-current modulation?

- A. It removes the need for centering
- B. It eliminates all image noise
- C. It guarantees identical dose for every patient
- D. It adjusts current to patient attenuation

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- A. Compton scattering
- B. Pair production
- C. Nuclear fission
- D. Photodisintegration

38. A radiation-protection review requires the technologist to determine: which response is appropriate after an unintended radiation event?

- A. Delete the dose record
- B. Follow facility reporting and patient-safety procedures
- C. Alter the order after scanning
- D. Avoid notifying responsible personnel

39. A protocol committee is reviewing radiation output. Which principle applies to this question: why is accurate patient centering important for dose optimization?

- A. It prevents all respiratory motion
- B. It eliminates the need for collimation
- C. It supports proper bow-tie filter and modulation performance
- D. It increases every displayed CT number

40. During a CT dose investigation, the technologist evaluates the following issue: why is accurate patient centering important for dose optimization?

- A. It supports proper bow-tie filter and modulation performance
- B. It increases every displayed CT number
- C. It eliminates the need for collimation
- D. It prevents all respiratory motion

41. To optimize exposure without sacrificing the clinical objective, the team asks: how is dose-length product calculated?

- A. mAs multiplied by pitch only
- B. CTDIvol divided by scan length
- C. kVp divided by rotation time
- D. CTDIvol multiplied by scan length

42. A radiation-protection review requires the technologist to determine: what does overranging describe in helical CT?

- A. Radiation beyond planned image boundaries needed for interpolation
- B. Electronic magnification after acquisition
- C. Repeat scanning caused by patient motion
- D. A wider display window

43. A completed series is being evaluated for technical quality. The technologist asks: what happens when window width is narrowed?

- A. Pixel size increases
- B. Acquired dose increases
- C. Displayed contrast increases
- D. Displayed contrast decreases

44. During reconstruction and postprocessing, which concept resolves this question: what is the main advantage of isotropic voxels?

- A. Automatic dose reduction
- B. High-quality reformations in any plane
- C. No need for raw data
- D. Elimination of all noise

45. The CT images show an unexpected appearance. Troubleshooting begins with this question: what is the primary effect of increasing reconstruction slice thickness?

- A. No change in voxel dimensions
- B. Guaranteed higher spatial resolution
- C. Higher noise with less averaging
- D. Lower image noise with more partial-volume averaging

46. While adjusting an imaging protocol, the technologist evaluates: which postprocessing method emphasizes the highest-attenuation voxels along each ray?

- A. Maximum intensity projection
- B. Minimum intensity projection
- C. Multiplanar reformation
- D. Surface smoothing only

47. A completed series is being evaluated for technical quality. The technologist asks: what causes aliasing artifact in CT?

- A. Correct detector calibration
- B. Excessive hand hygiene
- C. A properly centered phantom
- D. Insufficient angular or spatial sampling

48. During reconstruction and postprocessing, which concept resolves this question: which artifact is most associated with patient movement during acquisition?

- A. Uniform water calibration error
- B. Misregistration streaks and blurring
- C. Aliasing from undersampling only
- D. Concentric detector rings

49. The CT images show an unexpected appearance. Troubleshooting begins with this question: what does increasing matrix size while keeping DFOV constant do?

- A. Increases pixel size
- B. Increases slice thickness
- C. Decreases pixel size
- D. Changes contrast concentration

50. While adjusting an imaging protocol, the technologist evaluates: what is the function of slip rings in a CT gantry?

- A. Measure serum creatinine
- B. Set the display window
- C. Store finalized reports
- D. Permit continuous electrical connection during rotation

51. A completed series is being evaluated for technical quality. The technologist asks: which reconstruction change generally improves in-plane spatial resolution?

- A. Use a wider slice thickness
- B. Use a smoother algorithm
- C. Use a smaller display field of view
- D. Use a larger display field of view

52. During reconstruction and postprocessing, which concept resolves this question: what is the primary effect of increasing reconstruction slice thickness?

- A. Lower image noise with more partial-volume averaging
- B. Higher noise with less averaging
- C. Guaranteed higher spatial resolution
- D. No change in voxel dimensions

53. The CT images show an unexpected appearance. Troubleshooting begins with this question: which postprocessing method is useful for displaying low-attenuation airways?

- A. Maximum intensity projection
- B. Minimum intensity projection
- C. Bone subtraction only
- D. Calcium scoring only

54. While adjusting an imaging protocol, the technologist evaluates: what is the function of slip rings in a CT gantry?

- A. Permit continuous electrical connection during rotation
- B. Store finalized reports
- C. Measure serum creatinine
- D. Set the display window

55. A completed series is being evaluated for technical quality. The technologist asks: what artifact commonly appears as concentric circles centered on the rotation axis?

- A. Partial-volume artifact
- B. Ring artifact
- C. Stair-step artifact
- D. Motion artifact

56. During reconstruction and postprocessing, which concept resolves this question: which algorithm is most appropriate for evaluating lung parenchyma?

- A. A bone-removal mask only
- B. A very smooth soft-tissue kernel
- C. A cardiac calcium threshold alone
- D. A high-spatial-frequency sharp kernel

57. The CT images show an unexpected appearance. Troubleshooting begins with this question: what does a CT uniformity test assess?

- A. Monitor room temperature only
- B. Patient heart-rate variability
- C. Consistency of CT numbers across a uniform phantom
- D. Contrast injector pressure only

58. While adjusting an imaging protocol, the technologist evaluates: what is the purpose of iterative reconstruction?

- A. Convert DICOM into paper only
- B. Increase scan length automatically
- C. Reduce noise and artifacts through repeated model-based estimates
- D. Replace all detector calibration

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- A. Use a wider slice thickness
- B. Use a larger display field of view
- C. Use a smoother algorithm
- D. Use a smaller display field of view

60. During reconstruction and postprocessing, which concept resolves this question: what determines pixel size in a reconstructed CT image?

- A. Slice thickness multiplied by pitch
- B. Display field of view divided by matrix size
- C. Window width plus window level
- D. Tube current divided by time

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- A. Reduce noise and artifacts through repeated model-based estimates
- B. Increase scan length automatically
- C. Replace all detector calibration
- D. Convert DICOM into paper only

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- A. High-quality reformations in any plane
- B. No need for raw data
- C. Elimination of all noise
- D. Automatic dose reduction

63. A completed series is being evaluated for technical quality. The technologist asks: what does partial-volume averaging occur when?

- A. Every voxel contains one tissue
- B. The window level equals zero
- C. Different tissues occupy the same voxel
- D. The patient is exactly centered

64. During reconstruction and postprocessing, which concept resolves this question: which artifact is most associated with patient movement during acquisition?

- A. Concentric detector rings
- B. Misregistration streaks and blurring
- C. Uniform water calibration error
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- A. Bone subtraction only
- B. Calcium scoring only
- C. Maximum intensity projection
- D. Minimum intensity projection

66. While adjusting an imaging protocol, the technologist evaluates: which data are required to reconstruct images with a different kernel after scanning?

- A. Raw projection data
- B. Only archived dose pages
- C. Only the radiology report
- D. Only a screenshot

67. A completed series is being evaluated for technical quality. The technologist asks: which standard supports interoperable medical image files and metadata?

- A. ASCII
- B. HTML
- C. DICOM
- D. JPEG alone

68. During reconstruction and postprocessing, which concept resolves this question: which CT number is expected for water on a properly calibrated scanner?

- A. Approximately +1000 HU
- B. Approximately 0 HU
- C. Approximately +3000 HU
- D. Approximately -1000 HU

69. The CT images show an unexpected appearance. Troubleshooting begins with this question: which postprocessing method emphasizes the highest-attenuation voxels along each ray?

- A. Maximum intensity projection
- B. Multiplanar reformation
- C. Minimum intensity projection
- D. Surface smoothing only

70. While adjusting an imaging protocol, the technologist evaluates: window level primarily controls which display characteristic?

- A. The number of detector channels
- B. The x-ray tube heat capacity
- C. The table travel per rotation
- D. The center CT number of the gray-scale range

71. A completed series is being evaluated for technical quality. The technologist asks: which field controls the anatomy included in raw projection sampling?

- A. Window width
- B. Display field of view
- C. Window level
- D. Scan field of view

72. During reconstruction and postprocessing, which concept resolves this question: which display change best evaluates very dense bone?

- A. Delete the raw data
- B. Use a wide window centered at a high level
- C. Use a narrow window centered near water
- D. Reduce DFOV to zero

73. The CT images show an unexpected appearance. Troubleshooting begins with this question: which acquisition mode collects an entire volume in one gantry rotation without table motion during exposure?

- A. Helical acquisition
- B. Scout acquisition
- C. Volumetric acquisition
- D. Retrospective windowing

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- A. Only archived dose pages
- B. Raw projection data
- C. Only the radiology report
- D. Only a screenshot

75. A completed series is being evaluated for technical quality. The technologist asks: what is temporal resolution?

- A. Ability to distinguish changes occurring close together in time
- B. Ability to display subtle attenuation differences
- C. Ability to distinguish adjacent small objects
- D. Ability to store images without compression

76. During reconstruction and postprocessing, which concept resolves this question: what happens when window width is narrowed?

- A. Acquired dose increases
- B. Pixel size increases
- C. Displayed contrast increases
- D. Displayed contrast decreases

77. The CT images show an unexpected appearance. Troubleshooting begins with this question: how can beam-hardening artifact near dense bone often be reduced?

- A. Decrease calibration frequency
- B. Increase patient motion
- C. Use incomplete projection data
- D. Apply correction software or adjust acquisition parameters

78. While adjusting an imaging protocol, the technologist evaluates: which standard supports interoperable medical image files and metadata?

- A. DICOM
- B. ASCII
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79. A completed series is being evaluated for technical quality. The technologist asks: what artifact commonly appears as concentric circles centered on the rotation axis?

- A. Stair-step artifact
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80. During reconstruction and postprocessing, which concept resolves this question: what does a CT uniformity test assess?

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- B. Apply correction software or adjust acquisition parameters
- C. Decrease calibration frequency
- D. Use incomplete projection data

82. While adjusting an imaging protocol, the technologist evaluates: which field controls the anatomy included in raw projection sampling?

- A. Display field of view
- B. Scan field of view
- C. Window level
- D. Window width

83. A completed series is being evaluated for technical quality. The technologist asks: which factor most directly improves low-contrast resolution?

- A. Reducing image noise
- B. Increasing pixel size alone
- C. Reducing photon number
- D. Using a sharper kernel

84. During reconstruction and postprocessing, which concept resolves this question: which factor most directly improves low-contrast resolution?

- A. Using a sharper kernel
- B. Reducing photon number
- C. Increasing pixel size alone
- D. Reducing image noise

85. The CT images show an unexpected appearance. Troubleshooting begins with this question: what is temporal resolution?

- A. Ability to distinguish adjacent small objects
- B. Ability to store images without compression
- C. Ability to distinguish changes occurring close together in time
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- A. A very smooth soft-tissue kernel
- B. A high-spatial-frequency sharp kernel
- C. A bone-removal mask only
- D. A cardiac calcium threshold alone

87. A completed series is being evaluated for technical quality. The technologist asks: what determines pixel size in a reconstructed CT image?

- A. Display field of view divided by matrix size
- B. Slice thickness multiplied by pitch
- C. Tube current divided by time
- D. Window width plus window level

88. During reconstruction and postprocessing, which concept resolves this question: which display change best evaluates very dense bone?

- A. Use a narrow window centered near water
- B. Delete the raw data
- C. Reduce DFOV to zero
- D. Use a wide window centered at a high level

89. The CT images show an unexpected appearance. Troubleshooting begins with this question: what causes aliasing artifact in CT?

- A. A properly centered phantom
- B. Excessive hand hygiene
- C. Correct detector calibration
- D. Insufficient angular or spatial sampling

90. While adjusting an imaging protocol, the technologist evaluates: window level primarily controls which display characteristic?

- A. The table travel per rotation
- B. The number of detector channels
- C. The center CT number of the gray-scale range
- D. The x-ray tube heat capacity

91. A completed series is being evaluated for technical quality. The technologist asks: what does partial-volume averaging occur when?

- A. The window level equals zero
- B. Every voxel contains one tissue
- C. Different tissues occupy the same voxel
- D. The patient is exactly centered

92. During reconstruction and postprocessing, which concept resolves this question: what does increasing matrix size while keeping DFOV constant do?

- A. Increases slice thickness
- B. Decreases pixel size
- C. Changes contrast concentration
- D. Increases pixel size

93. The CT images show an unexpected appearance. Troubleshooting begins with this question: which CT number is expected for water on a properly calibrated scanner?

- A. Approximately 0 HU
- B. Approximately +1000 HU
- C. Approximately -1000 HU
- D. Approximately +3000 HU

94. While adjusting an imaging protocol, the technologist evaluates: which acquisition mode collects an entire volume in one gantry rotation without table motion during exposure?

- A. Scout acquisition
- B. Volumetric acquisition
- C. Retrospective windowing
- D. Helical acquisition

95. A patient-specific CT protocol is being planned. Which choice best answers this clinical question: which plane best demonstrates the relationship of cervical neural foramina?

- A. Axial pelvis scout
- B. Curved dental panorama only
- C. Single coronal chest image
- D. Oblique sagittal reformations

96. During an indication-driven examination, the technologist must decide: for orbital trauma, which reconstruction is particularly useful for the orbital floor?

- A. Coronal reformation
- B. Pelvic volume rendering only
- C. Sagittal lumbar MinIP
- D. Axial chest MIP

97. The radiologist requests optimized anatomy coverage and timing. The technologist considers: what scan phase best evaluates active arterial bleeding after trauma?

- A. Delayed noncontrast phase
- B. Routine scout only
- C. Arterial phase
- D. Oral contrast phase only

98. A cross-sectional anatomy and protocol review presents this question: which CT finding is most characteristic of acute intracranial hemorrhage on a noncontrast scan?

- A. Complete absence of mass effect
- B. Uniform fat attenuation
- C. Air-equivalent attenuation
- D. Focal hyperattenuation

99. A patient-specific CT protocol is being planned. Which choice best answers this clinical question: which finding suggests splenic laceration?

- A. Linear low attenuation with perisplenic fluid
- B. Calcification of costal cartilage
- C. Uniform homogeneous enhancement
- D. Gas confined to the stomach

100. During an indication-driven examination, the technologist must decide: during portal venous phase abdominal CT, which organ usually demonstrates relatively homogeneous parenchymal enhancement?

- A. Subcutaneous fat
- B. Liver
- C. Urinary bladder lumen
- D. Gas-filled colon

101. The radiologist requests optimized anatomy coverage and timing. The technologist considers: which phase best demonstrates hypervascular liver lesions?

- A. Noncontrast phase only
- B. Delayed excretory phase
- C. Late arterial phase
- D. Very late equilibrium only

102. A cross-sectional anatomy and protocol review presents this question: which acquisition timing is essential for coronary CT angiography?

- A. Synchronization with the cardiac cycle
- B. Random triggering after contrast
- C. Synchronization with swallowing
- D. Delay until bladder filling

103. A patient-specific CT protocol is being planned. Which choice best answers this clinical question: which CT appearance is typical of an acute subdural hematoma?

- A. Air-fluid level in the ventricle
- B. Biconvex collection limited by sutures
- C. Crescent-shaped extra-axial hyperattenuation
- D. Diffuse fat attenuation around brain

104. During an indication-driven examination, the technologist must decide: which structure is normally located in the right lower quadrant near the cecum?

- A. Spleen
- B. Appendix
- C. Left adrenal gland
- D. Pancreatic tail

105. The radiologist requests optimized anatomy coverage and timing. The technologist considers: which phase best evaluates urinary collecting-system opacification after IV contrast?

- A. Immediate pulmonary arterial phase
- B. Early arterial phase
- C. Noncontrast scout only
- D. Delayed excretory phase

106. A cross-sectional anatomy and protocol review presents this question: for routine noncontrast brain CT, images are commonly aligned to reduce direct lens exposure while covering the brain. Which plane is used?

- A. A sagittal plane through one orbit
- B. A plane parallel to the supraorbitomeatal line
- C. A coronal plane through the mandible
- D. An axial plane through the maxillary teeth

107. A patient-specific CT protocol is being planned. Which choice best answers this clinical question: for suspected pulmonary embolism, where is the bolus-tracking ROI commonly placed?

- A. Urinary bladder
- B. Left renal cortex
- C. Main pulmonary artery
- D. Superior sagittal sinus

108. During an indication-driven examination, the technologist must decide: which CT feature is typical of acute pancreatitis?

- A. Air-filled pancreatic duct in every case
- B. Isolated bladder wall thickening
- C. Uniformly calcified pancreas only
- D. Peripancreatic fat stranding

109. The radiologist requests optimized anatomy coverage and timing. The technologist considers: for a soft-tissue neck CT with contrast, what coverage is commonly needed?

- A. Skull base through thoracic inlet
- B. Knees through ankles
- C. Vertex through orbits only
- D. Diaphragm through pelvis

110. A cross-sectional anatomy and protocol review presents this question: for extremity trauma, why are thin isotropic data valuable?

- A. They remove all radiation dose
- B. They eliminate the need for positioning
- C. They guarantee no metal artifact
- D. They support high-resolution multiplanar and 3D reformations

111. A patient-specific CT protocol is being planned. Which choice best answers this clinical question: which position can help distinguish mobile pleural fluid from fixed pleural thickening?

- A. Prone head CT position
- B. Decubitus position
- C. Standing without scanning
- D. Supine position only

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- A. Peripancreatic fat stranding
- B. Uniformly calcified pancreas only
- C. Air-filled pancreatic duct in every case
- D. Isolated bladder wall thickening

113. The radiologist requests optimized anatomy coverage and timing. The technologist considers: which contrast route is used for CT arthrography?

- A. Subcutaneous injection
- B. Intrathecal injection
- C. Intra-articular injection
- D. Inhaled administration

114. A cross-sectional anatomy and protocol review presents this question: which CT appearance is typical of an acute subdural hematoma?

- A. Air-fluid level in the ventricle
- B. Diffuse fat attenuation around brain
- C. Biconvex collection limited by sutures
- D. Crescent-shaped extra-axial hyperattenuation

115. A patient-specific CT protocol is being planned. Which choice best answers this clinical question: after CT myelography, where is contrast located?

- A. Epidural fat only
- B. Subarachnoid space
- C. Pleural space
- D. Peritoneal cavity

116. During an indication-driven examination, the technologist must decide: for CT-guided biopsy planning, which factor is most important when choosing the needle path?

- A. Choose the longest route possible
- B. Cross aerated lung unnecessarily
- C. Avoid critical structures while reaching the lesion
- D. Ignore intervening vessels

117. The radiologist requests optimized anatomy coverage and timing. The technologist considers: which reformation best displays the long axis of a tortuous vessel?

- A. Curved planar reformation
- B. Unprocessed localizer only
- C. Single fixed axial image
- D. Minimum intensity projection

118. A cross-sectional anatomy and protocol review presents this question: for a renal stone CT, which protocol is generally appropriate first?

- A. High-dose multiphase CTA
- B. Noncontrast thin-section acquisition
- C. Delayed contrast-only acquisition
- D. Routine positive oral contrast

119. A patient-specific CT protocol is being planned. Which choice best answers this clinical question: which finding suggests splenic laceration?

- A. Linear low attenuation with perisplenic fluid
- B. Uniform homogeneous enhancement
- C. Calcification of costal cartilage
- D. Gas confined to the stomach

120. During an indication-driven examination, the technologist must decide: why may nitroglycerin be administered before coronary CTA?

- A. Reduce renal filtration
- B. Increase bowel opacification
- C. Dilate coronary arteries
- D. Collapse the lungs

121. The radiologist requests optimized anatomy coverage and timing. The technologist considers: in CT angiography of the head, bolus tracking is used primarily to do what?

- A. Select a lung window
- B. Eliminate the need for IV access
- C. Measure bone mineral density
- D. Begin scanning when arterial enhancement reaches a threshold

122. A cross-sectional anatomy and protocol review presents this question: for CT-guided biopsy planning, which factor is most important when choosing the needle path?

- A. Avoid critical structures while reaching the lesion
- B. Ignore intervening vessels
- C. Choose the longest route possible
- D. Cross aerated lung unnecessarily

123. A patient-specific CT protocol is being planned. Which choice best answers this clinical question: which CT appearance is typical of an acute epidural hematoma?

- A. Crescent crossing cranial sutures
- B. Diffuse low-attenuation scalp fat
- C. Biconvex extra-axial hyperattenuation
- D. Symmetric ventricular air

124. During an indication-driven examination, the technologist must decide: which structure is normally located in the right lower quadrant near the cecum?

- A. Left adrenal gland
- B. Spleen
- C. Pancreatic tail
- D. Appendix

125. The radiologist requests optimized anatomy coverage and timing. The technologist considers: which finding suggests small-bowel obstruction?

- A. Symmetric renal enhancement
- B. Dilated proximal loops with a transition point
- C. Isolated splenic calcification
- D. Uniform decompression of all bowel

126. A cross-sectional anatomy and protocol review presents this question: for temporal bone CT, which technique is most appropriate?

- A. Thin sections with a sharp bone algorithm
- B. Thick sections with a smooth kernel
- C. Low-resolution soft-tissue images only
- D. Wide sections without reformations

127. A patient-specific CT protocol is being planned. Which choice best answers this clinical question: why may beta-blocker medication be used before coronary CTA?

- A. Produce lung hyperinflation
- B. Lower heart rate to reduce motion
- C. Increase bowel peristalsis
- D. Raise renal attenuation

128. During an indication-driven examination, the technologist must decide: for CT colonography, what preparation is important for distinguishing residual material from polyps?

- A. Scanning only one position
- B. Eliminating colonic distention
- C. Fecal and fluid tagging
- D. Using no bowel preparation

129. The radiologist requests optimized anatomy coverage and timing. The technologist considers: which finding suggests small-bowel obstruction?

- A. Uniform decompression of all bowel
- B. Symmetric renal enhancement
- C. Isolated splenic calcification
- D. Dilated proximal loops with a transition point

130. A cross-sectional anatomy and protocol review presents this question: for temporal bone CT, which technique is most appropriate?

- A. Thin sections with a sharp bone algorithm
- B. Low-resolution soft-tissue images only
- C. Wide sections without reformations
- D. Thick sections with a smooth kernel

131. A patient-specific CT protocol is being planned. Which choice best answers this clinical question: in appendicitis, which CT finding most strongly supports the diagnosis?

- A. A decompressed gallbladder
- B. Air in the rectum alone
- C. Dilated appendix with periappendiceal inflammation
- D. Homogeneous spleen enhancement

132. During an indication-driven examination, the technologist must decide: which plane best demonstrates the relationship of cervical neural foramina?

- A. Curved dental panorama only
- B. Oblique sagittal reformations
- C. Axial pelvis scout
- D. Single coronal chest image

133. The radiologist requests optimized anatomy coverage and timing. The technologist considers: which phase best demonstrates hypervascular liver lesions?

- A. Very late equilibrium only
- B. Delayed excretory phase
- C. Noncontrast phase only
- D. Late arterial phase

134. A cross-sectional anatomy and protocol review presents this question: for extremity trauma, why are thin isotropic data valuable?

- A. They eliminate the need for positioning
- B. They support high-resolution multiplanar and 3D reformations
- C. They remove all radiation dose
- D. They guarantee no metal artifact

135. A patient-specific CT protocol is being planned. Which choice best answers this clinical question: which breathing instruction helps reduce motion during routine chest CT?

- A. Perform repeated Valsalva maneuvers
- B. Pant rapidly throughout scanning
- C. Swallow continuously
- D. Suspend respiration at full inspiration

136. During an indication-driven examination, the technologist must decide: for routine noncontrast brain CT, images are commonly aligned to reduce direct lens exposure while covering the brain. Which plane is used?

- A. A plane parallel to the supraorbitomeatal line
- B. A sagittal plane through one orbit
- C. An axial plane through the maxillary teeth
- D. A coronal plane through the mandible

137. The radiologist requests optimized anatomy coverage and timing. The technologist considers: after CT myelography, where is contrast located?

- A. Peritoneal cavity
- B. Pleural space
- C. Subarachnoid space
- D. Epidural fat only

138. A cross-sectional anatomy and protocol review presents this question: for suspected pulmonary embolism, where is the bolus-tracking ROI commonly placed?

- A. Left renal cortex
- B. Superior sagittal sinus
- C. Main pulmonary artery
- D. Urinary bladder

139. A patient-specific CT protocol is being planned. Which choice best answers this clinical question: for CT colonography, what preparation is important for distinguishing residual material from polyps?

- A. Fecal and fluid tagging
- B. Scanning only one position
- C. Using no bowel preparation
- D. Eliminating colonic distention

140. During an indication-driven examination, the technologist must decide: for suspected aortic dissection, what coverage is commonly required?

- A. Only the lower legs
- B. From thoracic inlet through the pelvis
- C. Only the kidneys
- D. Only the skull base

141. The radiologist requests optimized anatomy coverage and timing. The technologist considers: which structure lies anterior to the vertebral body and posterior to the pancreas in the upper abdomen?

- A. Gallbladder
- B. Ascending colon
- C. Rectus abdominis
- D. Abdominal aorta

142. A cross-sectional anatomy and protocol review presents this question: for routine noncontrast brain CT, images are commonly aligned to reduce direct lens exposure while covering the brain. Which plane is used?

- A. A coronal plane through the mandible
- B. An axial plane through the maxillary teeth
- C. A plane parallel to the supraorbitomeatal line
- D. A sagittal plane through one orbit

143. A patient-specific CT protocol is being planned. Which choice best answers this clinical question: which acquisition timing is essential for coronary CT angiography?

- A. Synchronization with swallowing
- B. Delay until bladder filling
- C. Random triggering after contrast
- D. Synchronization with the cardiac cycle

144. During an indication-driven examination, the technologist must decide: in CT angiography of the head, bolus tracking is used primarily to do what?

- A. Begin scanning when arterial enhancement reaches a threshold
- B. Measure bone mineral density
- C. Select a lung window
- D. Eliminate the need for IV access

145. The radiologist requests optimized anatomy coverage and timing. The technologist considers: which structure lies anterior to the vertebral body and posterior to the pancreas in the upper abdomen?

- A. Gallbladder
- B. Abdominal aorta
- C. Ascending colon
- D. Rectus abdominis

146. A cross-sectional anatomy and protocol review presents this question: for a soft-tissue neck CT with contrast, what coverage is commonly needed?

- A. Skull base through thoracic inlet
- B. Vertex through orbits only
- C. Diaphragm through pelvis
- D. Knees through ankles

147. A patient-specific CT protocol is being planned. Which choice best answers this clinical question: for suspected aortic dissection, what coverage is commonly required?

- A. Only the kidneys
- B. Only the lower legs
- C. Only the skull base
- D. From thoracic inlet through the pelvis

148. During an indication-driven examination, the technologist must decide: for orbital trauma, which reconstruction is particularly useful for the orbital floor?

- A. Sagittal lumbar MinIP
- B. Coronal reformation
- C. Axial chest MIP
- D. Pelvic volume rendering only

149. The radiologist requests optimized anatomy coverage and timing. The technologist considers: which phase is commonly used for routine evaluation of most abdominal solid organs?

- A. Noncontrast phase in every case
- B. Early cortical phase only
- C. Portal venous phase
- D. Pulmonary arterial phase

150. A cross-sectional anatomy and protocol review presents this question: why may nitroglycerin be administered before coronary CTA?

- A. Dilate coronary arteries
- B. Reduce renal filtration
- C. Increase bowel opacification
- D. Collapse the lungs

151. A patient-specific CT protocol is being planned. Which choice best answers this clinical question: what scan phase best evaluates active arterial bleeding after trauma?

- A. Delayed noncontrast phase
- B. Routine scout only
- C. Arterial phase
- D. Oral contrast phase only

152. During an indication-driven examination, the technologist must decide: which position can help distinguish mobile pleural fluid from fixed pleural thickening?

- A. Supine position only
- B. Standing without scanning
- C. Prone head CT position
- D. Decubitus position

153. The radiologist requests optimized anatomy coverage and timing. The technologist considers: why may beta-blocker medication be used before coronary CTA?

- A. Produce lung hyperinflation
- B. Lower heart rate to reduce motion
- C. Raise renal attenuation
- D. Increase bowel peristalsis

154. A cross-sectional anatomy and protocol review presents this question: which CT appearance is typical of an acute epidural hematoma?

- A. Crescent crossing cranial sutures
- B. Biconvex extra-axial hyperattenuation
- C. Diffuse low-attenuation scalp fat
- D. Symmetric ventricular air

155. A patient-specific CT protocol is being planned. Which choice best answers this clinical question: which CT finding is most characteristic of acute intracranial hemorrhage on a noncontrast scan?

- A. Uniform fat attenuation
- B. Air-equivalent attenuation
- C. Complete absence of mass effect
- D. Focal hyperattenuation

156. During an indication-driven examination, the technologist must decide: which breathing instruction helps reduce motion during routine chest CT?

- A. Suspend respiration at full inspiration
- B. Perform repeated Valsalva maneuvers
- C. Pant rapidly throughout scanning
- D. Swallow continuously

157. The radiologist requests optimized anatomy coverage and timing. The technologist considers: which contrast route is used for CT arthrography?

- A. Subcutaneous injection
- B. Intrathecal injection
- C. Intra-articular injection
- D. Inhaled administration

158. A cross-sectional anatomy and protocol review presents this question: for a renal stone CT, which protocol is generally appropriate first?

- A. High-dose multiphase CTA
- B. Delayed contrast-only acquisition
- C. Noncontrast thin-section acquisition
- D. Routine positive oral contrast

159. A patient-specific CT protocol is being planned. Which choice best answers this clinical question: what is the principal advantage of prone imaging for suspected ureterovesical junction stone?

- A. Differentiate a UVJ stone from a bladder stone
- B. Eliminate all pelvic artifacts
- C. Measure cardiac ejection fraction
- D. Increase arterial enhancement

160. During an indication-driven examination, the technologist must decide: what is the principal advantage of prone imaging for suspected ureterovesical junction stone?

- A. Increase arterial enhancement
- B. Eliminate all pelvic artifacts
- C. Measure cardiac ejection fraction
- D. Differentiate a UVJ stone from a bladder stone

161. The radiologist requests optimized anatomy coverage and timing. The technologist considers: in appendicitis, which CT finding most strongly supports the diagnosis?

- A. Air in the rectum alone
- B. Dilated appendix with periappendiceal inflammation
- C. Homogeneous spleen enhancement
- D. A decompressed gallbladder

162. A cross-sectional anatomy and protocol review presents this question: during portal venous phase abdominal CT, which organ usually demonstrates relatively homogeneous parenchymal enhancement?

- A. Liver
- B. Subcutaneous fat
- C. Gas-filled colon
- D. Urinary bladder lumen

163. A patient-specific CT protocol is being planned. Which choice best answers this clinical question: which phase is commonly used for routine evaluation of most abdominal solid organs?

- A. Noncontrast phase in every case
- B. Early cortical phase only
- C. Portal venous phase
- D. Pulmonary arterial phase

164. During an indication-driven examination, the technologist must decide: which phase best evaluates urinary collecting-system opacification after IV contrast?

- A. Immediate pulmonary arterial phase
- B. Delayed excretory phase
- C. Early arterial phase
- D. Noncontrast scout only

165. The radiologist requests optimized anatomy coverage and timing. The technologist considers: which reformation best displays the long axis of a tortuous vessel?

- A. Single fixed axial image
- B. Minimum intensity projection
- C. Unprocessed localizer only
- D. Curved planar reformation

Practice Exam 12: Answer Key and Explanations

1. B — eGFR estimates kidney filtration and helps identify patients who may require additional contrast-risk assessment. The other values address infection, oxygen-carrying capacity, or coagulation rather than renal clearance. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

2. C — Gloves do not replace hand hygiene because contamination can occur during removal or through defects. Used gloves are discarded, sharps go directly into approved containers, and two-handed recapping increases needlestick risk. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address.

3. A — Renal function and current evidence-based policy determine whether metformin needs temporary interruption and follow-up. Height, display settings, and detector configuration do not determine medication management. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

4. B — Stridor signals upper-airway compromise and can rapidly become life-threatening, requiring emergency response and treatment. Warmth, metallic taste, and isolated sneezing are usually mild or expected effects. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

5. D — Stopping and protecting the patient prevents a fall while responsiveness and vital signs are assessed. Scanning, ambulation, or rapid medication administration before assessment can worsen a vasovagal episode or obscure deterioration. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address.

6. D — A supported semi-upright position can improve ventilation and comfort while monitoring continues. Unassessed Trendelenburg, prone obstruction, or unattended standing may worsen breathing or create a fall hazard. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

7. B — Voluntary cooperation after an understandable explanation commonly represents implied consent for a routine, low-risk action. It does not substitute for written informed consent when institutional policy or procedure risk requires it. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address.

8. C — A time-out prevents wrong-patient, wrong-procedure, and wrong-site events by requiring active confirmation immediately before the procedure. Technical display and archiving decisions occur elsewhere in the workflow. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

9. A — Stridor signals upper-airway compromise and can rapidly become life-threatening, requiring emergency response and treatment. Warmth, metallic taste, and isolated sneezing are usually mild or expected effects. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

10. A — Complete documentation identifies what was administered, how and where it was delivered, and the patient response. This supports continuity, safety review, and investigation of reactions or extravasation. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

11. B — A large antecubital vein usually tolerates the pressure and flow required for CT power injection. Small distal veins have greater extravasation risk, arteries must not be used, and compromised sites should be avoided. This distinction supports safe protocol selection, accurate image interpretation,

and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do.

12. C — Transient warmth and metallic taste are common physiologic effects of iodinated contrast. They do not alone indicate an allergic-like emergency, extravasation, or kidney injury, though continued observation remains appropriate. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated.

13. D — Confirming fasting status is part of preprocedure screening and reduces aspiration risk when sedation is planned. Changing contrast volume or position does not replace preparation, and baseline monitoring should not be delayed. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not.

14. D — Transient warmth and metallic taste are common physiologic effects of iodinated contrast. They do not alone indicate an allergic-like emergency, extravasation, or kidney injury, though continued observation remains appropriate. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated.

15. B — eGFR estimates kidney filtration and helps identify patients who may require additional contrast-risk assessment. The other values address infection, oxygen-carrying capacity, or coagulation rather than renal clearance. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

16. C — A large antecubital vein usually tolerates the pressure and flow required for CT power injection. Small distal veins have greater extravasation risk, arteries must not be used, and compromised sites should be avoided. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do.

17. A — Stopping the injection limits additional contrast in the soft tissues. The site and patient are then assessed according to policy. Increasing pressure, continuing injection, or applying a constrictive wrap can worsen injury. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not.

18. C — The device and access needle must both be verified as power-injectable, including approved pressure and flow limits. Appearance alone is insufficient, and exceeding labeling can damage the device or patient. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the.

19. A — A time-out prevents wrong-patient, wrong-procedure, and wrong-site events by requiring active confirmation immediately before the procedure. Technical display and archiving decisions occur elsewhere in the workflow. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

20. D — A qualified interpreter promotes accurate, confidential communication and supports meaningful consent. Children, gestures, or untranslated forms can omit critical information and do not reliably confirm patient understanding. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

21. B — Stopping the injection limits additional contrast in the soft tissues. The site and patient are then assessed according to policy. Increasing pressure, continuing injection, or applying a constrictive wrap can worsen injury. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not.

22. C — DLP equals CTDI_{vol} times irradiated scan length and therefore reflects both scanner output and examination coverage. It is expressed in mGy·cm and is not calculated from pitch or kVp alone. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the.

23. A — CTDI_{vol} normalizes weighted CTDI for pitch and describes scanner radiation output for a protocol. DLP incorporates scan length, effective dose estimates population risk, and exposure time alone is not a dose index. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not.

24. D — Tube-current modulation varies mA with patient size and attenuation to avoid unnecessary output while maintaining selected image quality. It cannot eliminate noise, compensate fully for poor centering, or give every patient the same dose. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices.

25. A — The inverse square law states intensity varies inversely with distance squared. Doubling distance produces one fourth the intensity. This distance principle supports personnel protection when remaining in the scan room is unavoidable. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not.

26. B — Reducing mAs decreases photon quantity and usually lowers dose, although image noise rises. Increasing mAs, scanning farther, or adding phases increases total exposure rather than reducing it. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT

practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

27. C — Reducing mAs decreases photon quantity and usually lowers dose, although image noise rises. Increasing mAs, scanning farther, or adding phases increases total exposure rather than reducing it. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

28. B — ALARA requires each phase and coverage region to be clinically justified and optimized. Routine repeats, excessive range, and unadjusted adult techniques add exposure without corresponding diagnostic benefit. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

29. D — At fixed technique, higher pitch advances the table farther per rotation, shortening irradiation per unit length and generally reducing dose. Modern automatic controls may alter mA, so protocol context still matters. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address.

30. B — Compton interactions dominate scatter production at diagnostic energies and can expose personnel near the patient. Pair production requires much higher photon energy, while photodisintegration and fission are not diagnostic CT interactions. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address.

31. A — Children require indication-specific and size-adjusted protocols because smaller bodies need less output and have greater lifetime radiation sensitivity. Adult settings, unnecessary phases, and excessive coverage conflict with optimization. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical.

32. C — The gray measures absorbed energy per unit mass, and milligray is commonly used for CT dose indices. Effective dose uses sievert, radioactivity uses becquerel, and resistance uses ohm. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical.

33. D — CTDI_{vol} normalizes weighted CTDI for pitch and describes scanner radiation output for a protocol. DLP incorporates scan length, effective dose estimates population risk, and exposure time alone is not a dose index. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not.

34. C — Overbeaming occurs when the penumbra extends beyond the active detector width. Appropriate collimation and detector configuration reduce the unused irradiated margin. Display and archive choices occur after exposure. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical.

35. B — Dose notifications prompt review when planned settings exceed configured values, helping prevent unintended high exposures. They do not assess allergies, calibrate detectors, or measure laboratory values. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

36. D — Tube-current modulation varies mA with patient size and attenuation to avoid unnecessary output while maintaining selected image quality. It cannot eliminate noise, compensate fully for poor centering, or give every patient the same dose. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices.

37. A — Compton interactions dominate scatter production at diagnostic energies and can expose personnel near the patient. Pair production requires much higher photon energy, while photodisintegration and fission are not diagnostic CT interactions. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address.

38. B — Adverse events require prompt documentation, escalation, and review under facility policy. Preserving accurate records supports patient care and prevention. Deleting or altering information undermines safety and accountability. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

39. C — Isocenter positioning lets the localizer, bow-tie filter, and exposure controls estimate attenuation correctly. Off-centering can alter dose and noise. It does not stop breathing, raise all CT numbers, or replace collimation. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address.

40. A — Isocenter positioning lets the localizer, bow-tie filter, and exposure controls estimate attenuation correctly. Off-centering can alter dose and noise. It does not stop breathing, raise all CT numbers, or replace collimation. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address.

41. D — DLP equals CTDI_{vol} times irradiated scan length and therefore reflects both scanner output and examination coverage. It is expressed in mGy·cm and is not calculated from pitch or kVp alone.

This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the.

42. A — Helical reconstruction requires data just beyond the imaged range, creating irradiation outside the prescribed boundaries. Overranging is distinct from repeat scanning, display magnification, or window adjustment. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

43. C — A narrow window maps a smaller HU range across available gray shades, increasing displayed contrast. Windowing changes presentation after acquisition and does not alter pixel size or patient dose. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated.

44. B — Equal voxel dimensions permit reformations with similar spatial resolution across planes, supporting detailed MPR and 3D work. Isotropy does not eliminate noise, remove raw-data needs, or automatically lower dose. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated.

45. D — Thicker slices include more photons and average more tissue, reducing noise but increasing partial-volume effects and reducing z-axis resolution. They do not leave voxel size unchanged or guarantee better detail. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the.

46. A — MIP selects the highest voxel value along each viewing ray, making contrast-enhanced vessels and calcifications conspicuous. MinIP emphasizes low values, while MPR displays sections in another plane. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

47. D — Aliasing arises when projection sampling is inadequate for the spatial frequencies present, creating fine stripes or streaks. Proper sampling and reconstruction choices reduce it. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

48. B — Motion changes anatomy between projections, producing inconsistency reconstructed as streaks, shading, or blurring. Rings point to detector calibration, and water errors reflect quality-control issues. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

49. C — More matrix elements across the same field create smaller pixels and potentially better displayed spatial resolution. It does not directly alter slice thickness or contrast concentration. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

50. D — Slip rings transfer electrical power and signals across rotating components without cables winding around the gantry. This enables continuous rotation used for helical CT. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

51. C — A smaller DFOV maps the anatomy onto smaller pixels for a fixed matrix, improving displayed in-plane resolution when acquisition data support it. Larger DFOV, thick slices, and smoothing reduce fine-detail visibility. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address.

52. A — Thicker slices include more photons and average more tissue, reducing noise but increasing partial-volume effects and reducing z-axis resolution. They do not leave voxel size unchanged or guarantee better detail. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the.

53. B — MinIP displays the lowest attenuation encountered along each ray, highlighting air-filled bronchi or low-density structures. MIP instead favors high-attenuation vessels and calcification. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

54. A — Slip rings transfer electrical power and signals across rotating components without cables winding around the gantry. This enables continuous rotation used for helical CT. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

55. B — A miscalibrated or defective detector element produces consistent errors through rotation, reconstructing as rings. Motion creates streaks or blurring, while stair-step and partial-volume appearances have different causes. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

56. D — A sharp kernel preserves high-frequency edge detail needed for lung structures, though it increases noise. Smooth kernels favor low-contrast soft tissue and can blur fine pulmonary detail. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT

practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

57. C — Uniformity testing compares CT numbers across locations in a homogeneous phantom to detect calibration or detector problems. It is not a patient, injector, or environmental measurement. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

58. C — Iterative methods repeatedly compare estimated images with measured data, reducing noise and some artifacts compared with conventional filtered backprojection. They do not determine coverage, eliminate calibration, or merely change file format. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address.

59. D — A smaller DFOV maps the anatomy onto smaller pixels for a fixed matrix, improving displayed in-plane resolution when acquisition data support it. Larger DFOV, thick slices, and smoothing reduce fine-detail visibility. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address.

60. B — Pixel size equals DFOV divided by the number of matrix elements across the image. Slice thickness defines voxel depth, while exposure and window settings do not determine in-plane pixel dimensions. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the.

61. A — Iterative methods repeatedly compare estimated images with measured data, reducing noise and some artifacts compared with conventional filtered backprojection. They do not determine coverage, eliminate calibration, or merely change file format. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address.

62. A — Equal voxel dimensions permit reformations with similar spatial resolution across planes, supporting detailed MPR and 3D work. Isotropy does not eliminate noise, remove raw-data needs, or automatically lower dose. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated.

63. C — When multiple tissues share a voxel, the system records their averaged attenuation, potentially obscuring small structures. Thin slices reduce this effect by decreasing voxel depth. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

64. B — Motion changes anatomy between projections, producing inconsistency reconstructed as streaks, shading, or blurring. Rings point to detector calibration, and water errors reflect quality-control issues. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

65. D — MinIP displays the lowest attenuation encountered along each ray, highlighting air-filled bronchi or low-density structures. MIP instead favors high-attenuation vessels and calcification. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

66. A — Raw data preserve measured projections needed for new reconstructions. A screenshot, report, or dose page lacks the projection information necessary to change slice thickness, interval, or algorithm. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

67. C — DICOM defines medical image objects, metadata, and communication services used among scanners, workstations, and archives. Generic formats alone do not preserve the same clinical identifiers and imaging information. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical.

68. B — Water is the reference at approximately zero Hounsfield units. Air is near minus 1000 HU and dense bone is positive. Regular quality control checks water accuracy and uniformity. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical.

69. A — MIP selects the highest voxel value along each viewing ray, making contrast-enhanced vessels and calcifications conspicuous. MinIP emphasizes low values, while MPR displays sections in another plane. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

70. D — Window level sets the central HU value represented by the gray scale, determining which tissues appear mid-gray. Detector count, tube heat, and table motion are acquisition properties. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

71. D — SFOV defines the acquisition area accepted by the detector and reconstruction system. DFOV selects how reconstructed anatomy is displayed, while window settings control gray-scale mapping. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT

practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

72. B — A wide window accommodates the broad range of high bone attenuation and a higher level centers the display appropriately. Narrow soft-tissue settings saturate dense structures. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

73. C — A sufficiently wide detector can acquire a volume during one rotation with the table stationary, useful for dynamic or cardiac studies. Helical scanning combines rotation with table movement. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical.

74. B — Raw data preserve measured projections needed for new reconstructions. A screenshot, report, or dose page lacks the projection information necessary to change slice thickness, interval, or algorithm. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

75. A — Temporal resolution describes how quickly the system captures changing anatomy, especially important in cardiac imaging. Spatial resolution concerns small objects, and contrast resolution concerns small attenuation differences. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

76. C — A narrow window maps a smaller HU range across available gray shades, increasing displayed contrast. Windowing changes presentation after acquisition and does not alter pixel size or patient dose. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated.

77. D — Beam-hardening correction, appropriate kVp, thinner sections, or optimized reconstruction can reduce dark bands and streaks near dense structures. Motion, incomplete data, and poor calibration worsen artifacts. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

78. A — DICOM defines medical image objects, metadata, and communication services used among scanners, workstations, and archives. Generic formats alone do not preserve the same clinical identifiers and imaging information. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical.

79. D — A miscalibrated or defective detector element produces consistent errors through rotation, reconstructing as rings. Motion creates streaks or blurring, while stair-step and partial-volume appearances have different causes. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

80. C — Uniformity testing compares CT numbers across locations in a homogeneous phantom to detect calibration or detector problems. It is not a patient, injector, or environmental measurement. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

81. B — Beam-hardening correction, appropriate kVp, thinner sections, or optimized reconstruction can reduce dark bands and streaks near dense structures. Motion, incomplete data, and poor calibration worsen artifacts. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

82. B — SFOV defines the acquisition area accepted by the detector and reconstruction system. DFOV selects how reconstructed anatomy is displayed, while window settings control gray-scale mapping. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

83. A — Low-contrast detectability improves when noise decreases, often through adequate photons, thicker sections, or iterative reconstruction. Sharp kernels and fewer photons increase noise and impair subtle contrast detection. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

84. D — Low-contrast detectability improves when noise decreases, often through adequate photons, thicker sections, or iterative reconstruction. Sharp kernels and fewer photons increase noise and impair subtle contrast detection. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

85. C — Temporal resolution describes how quickly the system captures changing anatomy, especially important in cardiac imaging. Spatial resolution concerns small objects, and contrast resolution concerns small attenuation differences. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

86. B — A sharp kernel preserves high-frequency edge detail needed for lung structures, though it increases noise. Smooth kernels favor low-contrast soft tissue and can blur fine pulmonary detail. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT

practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

87. A — Pixel size equals DFOV divided by the number of matrix elements across the image. Slice thickness defines voxel depth, while exposure and window settings do not determine in-plane pixel dimensions. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the.

88. D — A wide window accommodates the broad range of high bone attenuation and a higher level centers the display appropriately. Narrow soft-tissue settings saturate dense structures. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

89. D — Aliasing arises when projection sampling is inadequate for the spatial frequencies present, creating fine stripes or streaks. Proper sampling and reconstruction choices reduce it. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

90. C — Window level sets the central HU value represented by the gray scale, determining which tissues appear mid-gray. Detector count, tube heat, and table motion are acquisition properties. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

91. C — When multiple tissues share a voxel, the system records their averaged attenuation, potentially obscuring small structures. Thin slices reduce this effect by decreasing voxel depth. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

92. B — More matrix elements across the same field create smaller pixels and potentially better displayed spatial resolution. It does not directly alter slice thickness or contrast concentration. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

93. A — Water is the reference at approximately zero Hounsfield units. Air is near minus 1000 HU and dense bone is positive. Regular quality control checks water accuracy and uniformity. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical.

94. B — A sufficiently wide detector can acquire a volume during one rotation with the table stationary, useful for dynamic or cardiac studies. Helical scanning combines rotation with table movement. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical.

95. D — Oblique sagittal reformations aligned to the foramina show their caliber and relationship to discs and osteophytes. Unrelated chest, pelvis, or dental views do not evaluate cervical foramina. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

96. A — Coronal images show the orbital floor and inferior rectus relationship well, aiding detection of blowout fractures and entrapment. Thin axial source images permit high-quality reformations. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

97. C — Active arterial extravasation and vascular injury are most conspicuous during appropriately timed arterial imaging. Portal and delayed phases may add information about organ injury or persistent leakage. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

98. D — Fresh blood is usually hyperattenuating relative to brain on noncontrast CT because of its protein and cellular content. Appearance evolves over time, but fat or air attenuation is not typical. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the.

99. A — A laceration appears as an irregular or linear hypoattenuating defect, often with subcapsular hematoma or surrounding blood. Homogeneous enhancement argues against focal disruption. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

100. B — Portal venous timing produces strong, relatively homogeneous hepatic enhancement through portal inflow and is widely used for abdominal survey. Bladder urine, bowel gas, and fat do not show this pattern. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the.

101. C — Hypervascular lesions receive prominent arterial supply and may enhance conspicuously during late arterial imaging before background liver reaches peak portal enhancement. Later phases remain useful for washout characterization. This distinction supports safe protocol selection, accurate

image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical.

102. A — ECG synchronization reduces coronary motion by reconstructing data during selected cardiac phases. Swallowing and bladder timing are unrelated, while random triggering degrades coronary assessment. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

103. C — Acute subdural blood commonly forms a crescent along the cerebral convexity and can cross sutures, although dural reflections limit spread. A biconvex collection is more typical of epidural hemorrhage. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated.

104. B — The appendix arises from the cecum in the right lower quadrant, although its tip position varies. The spleen, pancreatic tail, and left adrenal gland are in the left upper abdomen. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the.

105. D — Delayed images allow filtered iodinated contrast to enter the calyces, ureters, and bladder, demonstrating urothelial anatomy and obstruction. Early arterial or pulmonary timing precedes urinary excretion. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

106. B — Aligning acquisition near the supraorbitomeatal line helps cover the brain while avoiding or reducing direct irradiation of the lenses when anatomy permits. Mandibular, unilateral orbital, or dental planes do not provide routine brain coverage. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices.

107. C — Monitoring the main pulmonary artery allows acquisition during peak pulmonary arterial enhancement for CTPA. Renal, bladder, and intracranial venous locations correspond to different physiologic phases. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

108. D — Inflammation commonly produces pancreatic enlargement, edema, and peripancreatic fat stranding or fluid. Ductal air, diffuse calcification, and bladder thickening do not define acute pancreatitis. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

109. A — Soft-tissue neck evaluation commonly covers the skull base through the thoracic inlet to include pharynx, larynx, lymph-node chains, vessels, and lower neck structures. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

110. D — Thin near-isotropic voxels allow accurate reformations along complex bones and joints and support surgical planning. They do not eliminate positioning, artifacts, or exposure. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

111. B — In a decubitus acquisition, free pleural fluid layers dependently while fixed pleural disease remains stationary. This positional behavior can clarify equivocal findings when clinically justified. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

112. A — Inflammation commonly produces pancreatic enlargement, edema, and peripancreatic fat stranding or fluid. Ductal air, diffuse calcification, and bladder thickening do not define acute pancreatitis. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

113. C — CT arthrography places diluted iodinated contrast directly into a joint under sterile conditions, outlining cartilage, labra, and intra-articular structures. Intrathecal contrast is used for myelography. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

114. D — Acute subdural blood commonly forms a crescent along the cerebral convexity and can cross sutures, although dural reflections limit spread. A biconvex collection is more typical of epidural hemorrhage. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated.

115. B — Myelography introduces approved contrast into the subarachnoid space so nerve roots and the thecal sac can be assessed. The epidural, peritoneal, and pleural spaces are different compartments. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

116. C — The safest path reaches the target while minimizing traversal of vessels, bowel, pleura, nerves, and other critical structures. Planning uses cross-sectional images and patient positioning to reduce complications. This distinction supports safe protocol selection, accurate image interpretation,

and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical.

117. A — Curved planar reformation follows a vessel centerline and displays its course in one plane, aiding stenosis and length assessment. A single axial slice or localizer cannot show the entire tortuous path. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address.

118. B — Most urinary calculi are directly visible on noncontrast CT, which avoids obscuring stones and unnecessary contrast. Thin sections support detection and reformations while dose should be optimized. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

119. A — A laceration appears as an irregular or linear hypoattenuating defect, often with subcapsular hematoma or surrounding blood. Homogeneous enhancement argues against focal disruption. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

120. C — Nitroglycerin can dilate coronary arteries, improving visualization of the lumen and smaller branches. Contraindications and blood pressure must be reviewed before administration. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

121. D — Bolus tracking monitors enhancement in a selected vessel and triggers acquisition near the desired vascular phase. It coordinates contrast timing rather than assessing bone, windowing lungs, or replacing access. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated.

122. A — The safest path reaches the target while minimizing traversal of vessels, bowel, pleura, nerves, and other critical structures. Planning uses cross-sectional images and patient positioning to reduce complications. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical.

123. C — Epidural blood often has a lentiform or biconvex shape and is limited by suture attachments. Subdural collections more often form crescents along the brain surface. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

124. D — The appendix arises from the cecum in the right lower quadrant, although its tip position varies. The spleen, pancreatic tail, and left adrenal gland are in the left upper abdomen. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the.

125. B — Mechanical obstruction typically produces dilated bowel proximal to a transition point and decompressed distal loops. Other listed findings do not describe bowel caliber or transit. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

126. A — The tiny ossicles, cochlea, semicircular canals, and bony margins require thin sections and a high-resolution bone kernel, often with targeted reformations. Thick smooth images obscure fine detail. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

127. B — A lower, regular heart rate lengthens relatively motion-free portions of the cardiac cycle and can improve coronary image quality. Medication use requires screening and adherence to authorized protocols. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical.

128. C — Tagging labels residual stool and fluid with oral contrast so software and readers can distinguish them from mucosal lesions. Adequate cleansing, distention, and usually two positions improve evaluation. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical.

129. D — Mechanical obstruction typically produces dilated bowel proximal to a transition point and decompressed distal loops. Other listed findings do not describe bowel caliber or transit. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

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131. C — An enlarged appendix accompanied by wall changes and surrounding fat stranding strongly supports acute appendicitis. The other findings are unrelated or nonspecific abdominal observations. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-

level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

132. B — Oblique sagittal reformations aligned to the foramina show their caliber and relationship to discs and osteophytes. Unrelated chest, pelvis, or dental views do not evaluate cervical foramina. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

133. D — Hypervascular lesions receive prominent arterial supply and may enhance conspicuously during late arterial imaging before background liver reaches peak portal enhancement. Later phases remain useful for washout characterization. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical.

134. B — Thin near-isotropic voxels allow accurate reformations along complex bones and joints and support surgical planning. They do not eliminate positioning, artifacts, or exposure. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

135. D — A consistent inspiratory breath-hold expands the lungs and minimizes respiratory motion for most routine chest studies. Panting, swallowing, or repeated straining introduces motion and variable anatomy. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

136. A — Aligning acquisition near the supraorbitomeatal line helps cover the brain while avoiding or reducing direct irradiation of the lenses when anatomy permits. Mandibular, unilateral orbital, or dental planes do not provide routine brain coverage. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices.

137. C — Myelography introduces approved contrast into the subarachnoid space so nerve roots and the thecal sac can be assessed. The epidural, peritoneal, and pleural spaces are different compartments. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

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140. B — Dissection can extend from the thoracic aorta into abdominal and iliac branches, so rapid angiographic coverage commonly spans chest through pelvis. Clinical concern may require additional coverage. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

141. D — The abdominal aorta descends anterior to the vertebral bodies and posterior to the pancreas. The gallbladder, colon, and rectus muscles occupy more anterior or lateral locations. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

142. C — Aligning acquisition near the supraorbitomeatal line helps cover the brain while avoiding or reducing direct irradiation of the lenses when anatomy permits. Mandibular, unilateral orbital, or dental planes do not provide routine brain coverage. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices.

143. D — ECG synchronization reduces coronary motion by reconstructing data during selected cardiac phases. Swallowing and bladder timing are unrelated, while random triggering degrades coronary assessment. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

144. A — Bolus tracking monitors enhancement in a selected vessel and triggers acquisition near the desired vascular phase. It coordinates contrast timing rather than assessing bone, windowing lungs, or replacing access. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated.

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146. A — Soft-tissue neck evaluation commonly covers the skull base through the thoracic inlet to include pharynx, larynx, lymph-node chains, vessels, and lower neck structures. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It

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148. B — Coronal images show the orbital floor and inferior rectus relationship well, aiding detection of blowout fractures and entrapment. Thin axial source images permit high-quality reformations. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

149. C — Portal venous phase balances hepatic, splenic, pancreatic, venous, and many lesion findings for broad abdominal assessment. Other phases are selected for specific indications. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

150. A — Nitroglycerin can dilate coronary arteries, improving visualization of the lumen and smaller branches. Contraindications and blood pressure must be reviewed before administration. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

151. C — Active arterial extravasation and vascular injury are most conspicuous during appropriately timed arterial imaging. Portal and delayed phases may add information about organ injury or persistent leakage. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

152. D — In a decubitus acquisition, free pleural fluid layers dependently while fixed pleural disease remains stationary. This positional behavior can clarify equivocal findings when clinically justified. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

153. B — A lower, regular heart rate lengthens relatively motion-free portions of the cardiac cycle and can improve coronary image quality. Medication use requires screening and adherence to authorized protocols. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical.

154. B — Epidural blood often has a lentiform or biconvex shape and is limited by suture attachments. Subdural collections more often form crescents along the brain surface. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

155. D — Fresh blood is usually hyperattenuating relative to brain on noncontrast CT because of its protein and cellular content. Appearance evolves over time, but fat or air attenuation is not typical. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the.

156. A — A consistent inspiratory breath-hold expands the lungs and minimizes respiratory motion for most routine chest studies. Panting, swallowing, or repeated straining introduces motion and variable anatomy. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

157. C — CT arthrography places diluted iodinated contrast directly into a joint under sterile conditions, outlining cartilage, labra, and intra-articular structures. Intrathecal contrast is used for myelography. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

158. C — Most urinary calculi are directly visible on noncontrast CT, which avoids obscuring stones and unnecessary contrast. Thin sections support detection and reformations while dose should be optimized. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

159. A — Prone positioning may move a free bladder calculus anteriorly, whereas an impacted UVJ stone remains at the posterior junction. This targeted maneuver can resolve location without contrast. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

160. D — Prone positioning may move a free bladder calculus anteriorly, whereas an impacted UVJ stone remains at the posterior junction. This targeted maneuver can resolve location without contrast. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

161. B — An enlarged appendix accompanied by wall changes and surrounding fat stranding strongly supports acute appendicitis. The other findings are unrelated or nonspecific abdominal observations. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-

level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

162. A — Portal venous timing produces strong, relatively homogeneous hepatic enhancement through portal inflow and is widely used for abdominal survey. Bladder urine, bowel gas, and fat do not show this pattern. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the.

163. C — Portal venous phase balances hepatic, splenic, pancreatic, venous, and many lesion findings for broad abdominal assessment. Other phases are selected for specific indications. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

164. B — Delayed images allow filtered iodinated contrast to enter the calyces, ureters, and bladder, demonstrating urothelial anatomy and obstruction. Early arterial or pulmonary timing precedes urinary excretion. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address the stated clinical or technical objective.

165. D — Curved planar reformation follows a vessel centerline and displays its course in one plane, aiding stenosis and length assessment. A single axial slice or localizer cannot show the entire tortuous path. This distinction supports safe protocol selection, accurate image interpretation, and consistent entry-level CT practice. It also helps the technologist recognize why the alternative choices do not address.