

PRACTICE EXAM 5: 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. Before iodinated contrast, which laboratory value most directly estimates renal filtration?
 - A. White blood cell count
 - B. Estimated glomerular filtration rate
 - C. Serum hemoglobin
 - D. Prothrombin time

2. 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

3. 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. Expected physiologic effects
 - C. Contrast extravasation
 - D. Acute renal failure

4. Which finding after contrast administration requires the most urgent response?

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

5. When selecting a peripheral vein for power injection, which site is generally preferred when suitable?

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

6. What is the first appropriate action when contrast extravasation is suspected during injection?

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

7. Which consent is typically demonstrated when a competent patient voluntarily extends an arm for routine venipuncture after explanation?

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

8. For a patient with limited English proficiency, which communication method is most appropriate for complex consent information?

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

9. Which step best reduces aspiration risk before a CT examination requiring oral sedation?

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

10. A patient becomes light-headed during IV placement. What should the technologist do first?

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

11. Which practice is required before accessing an implanted venous port for power injection?

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

12. Which documentation is most complete after a contrast injection?

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

13. Which infection-control action is appropriate after contact with blood?

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

14. A patient taking metformin is scheduled for iodinated contrast. What should guide medication instructions?

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

15. Which position most helps a dyspneic patient tolerate waiting before a chest CT?

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

16. In an entry-level CT setting, before iodinated contrast, which laboratory value most directly estimates renal filtration?

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

17. In an entry-level CT setting, which action is the essential purpose of a preprocedure time-out?

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

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

22. Which CT dose index represents scanner output averaged across a standard phantom and adjusted for pitch?

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

23. How is dose-length product calculated?

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

24. Which change generally lowers CT radiation dose when other factors remain constant?

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

25. What is the main dose benefit of automatic tube-current modulation?

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

26. Why is accurate patient centering important for dose optimization?

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

27. Which interaction is the major source of occupational scatter in diagnostic CT?

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

28. What does overranging describe in helical CT?

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

29. Which protocol change most directly reduces dose from z-axis overbeaming?

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

30. For the same geometry, doubling distance from a radiation source changes intensity to approximately what fraction?

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

31. Which action best follows ALARA during multiphase abdominal CT?

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

32. Increasing pitch above 1 in a fixed-mA helical acquisition generally has what effect?

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

33. Which quantity uses the unit milligray?

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

34. Which strategy is most appropriate for pediatric CT?

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

35. What is the primary purpose of a CT dose notification?

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

36. 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

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- A. DLP
- B. Effective dose
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- A. Pair production
- B. Compton scattering
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- D. Nuclear fission

43. What determines pixel size in a reconstructed CT image?

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

44. Which reconstruction change generally improves in-plane spatial resolution?

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

45. 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. No change in voxel dimensions
- D. Guaranteed higher spatial resolution

46. Which algorithm is most appropriate for evaluating lung parenchyma?

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

47. What happens when window width is narrowed?

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

48. Window level primarily controls which display characteristic?

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

49. 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

50. What artifact commonly appears as concentric circles centered on the rotation axis?

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

51. How can beam-hardening artifact near dense bone often be reduced?

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

52. Which postprocessing method emphasizes the highest-attenuation voxels along each ray?

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

53. Which postprocessing method is useful for displaying low-attenuation airways?

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

54. What is the main advantage of isotropic voxels?

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

55. Which data are required to reconstruct images with a different kernel after scanning?

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

56. What does partial-volume averaging occur when?

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

57. Which acquisition mode collects an entire volume in one gantry rotation without table motion during exposure?

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

58. What is the function of slip rings in a CT gantry?

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

59. 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

60. 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

61. Which artifact is most associated with patient movement during acquisition?

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

62. What is the purpose of iterative reconstruction?

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

63. Which field controls the anatomy included in raw projection sampling?

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

64. What is temporal resolution?

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

65. Which standard supports interoperable medical image files and metadata?

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

66. What does a CT uniformity test assess?

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

67. Which display change best evaluates very dense bone?

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

68. What causes aliasing artifact in CT?

- A. Excessive hand hygiene
- B. Insufficient angular or spatial sampling
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69. In an entry-level CT setting, what determines pixel size in a reconstructed CT image?

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- C. Correct detector calibration
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95. 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 coronal plane through the mandible
- C. A sagittal plane through one orbit
- D. An axial plane through the maxillary teeth

96. Which CT finding is most characteristic of acute intracranial hemorrhage on a noncontrast scan?

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

97. In CT angiography of the head, bolus tracking is used primarily to do what?

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

98. For suspected pulmonary embolism, where is the bolus-tracking ROI commonly placed?

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

99. Which breathing instruction helps reduce motion during routine chest CT?

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

100. Which structure lies anterior to the vertebral body and posterior to the pancreas in the upper abdomen?

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

101. During portal venous phase abdominal CT, which organ usually demonstrates relatively homogeneous parenchymal enhancement?

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

102. Which phase best demonstrates hypervascular liver lesions?

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

103. For a renal stone CT, which protocol is generally appropriate first?

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

104. Which phase best evaluates urinary collecting-system opacification after IV contrast?

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

105. In appendicitis, which CT finding most strongly supports the diagnosis?

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

106. Which CT feature is typical of acute pancreatitis?

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

107. For suspected aortic dissection, what coverage is commonly required?

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

108. Which reformation best displays the long axis of a tortuous vessel?

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

109. For temporal bone CT, which technique is most appropriate?

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

110. Which plane best demonstrates the relationship of cervical neural foramina?

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

111. For CT colonography, what preparation is important for distinguishing residual material from polyps?

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

112. 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

113. Why may beta-blocker medication be used before coronary CTA?

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

114. Why may nitroglycerin be administered before coronary CTA?

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

115. For CT-guided biopsy planning, which factor is most important when choosing the needle path?

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

116. Which position can help distinguish mobile pleural fluid from fixed pleural thickening?

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

117. What is the principal advantage of prone imaging for suspected ureterovesical junction stone?

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

118. Which finding suggests small-bowel obstruction?

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

119. Which structure is normally located in the right lower quadrant near the cecum?

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

120. For orbital trauma, which reconstruction is particularly useful for the orbital floor?

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

121. Which CT appearance is typical of an acute subdural hematoma?

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

122. Which CT appearance is typical of an acute epidural hematoma?

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

123. 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

124. Which finding suggests splenic laceration?

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

125. For extremity trauma, why are thin isotropic data valuable?

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

126. Which phase is commonly used for routine evaluation of most abdominal solid organs?

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

127. Which contrast route is used for CT arthrography?

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

128. After CT myelography, where is contrast located?

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

129. For a soft-tissue neck CT with contrast, what coverage is commonly needed?

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

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- C. Ascending colon
- D. Rectus abdominis

136. In an entry-level CT setting, during portal venous phase abdominal CT, which organ usually demonstrates relatively homogeneous parenchymal enhancement?

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

137. In an entry-level CT setting, which phase best demonstrates hypervascular liver lesions?

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

138. In an entry-level CT setting, for a renal stone CT, which protocol is generally appropriate first?

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

139. In an entry-level CT setting, which phase best evaluates urinary collecting-system opacification after IV contrast?

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

140. In an entry-level CT setting, in appendicitis, which CT finding most strongly supports the diagnosis?

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

141. In an entry-level CT setting, which CT feature is typical of acute pancreatitis?

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

142. In an entry-level CT setting, for suspected aortic dissection, what coverage is commonly required?

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

143. In an entry-level CT setting, which reformation best displays the long axis of a tortuous vessel?

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

144. In an entry-level CT setting, for temporal bone CT, which technique is most appropriate?

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

145. In an entry-level CT setting, which plane best demonstrates the relationship of cervical neural foramina?

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

146. In an entry-level CT setting, for CT colonography, what preparation is important for distinguishing residual material from polyps?

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

147. In an entry-level CT setting, which acquisition timing is essential for coronary CT angiography?

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

148. In an entry-level CT setting, why may beta-blocker medication be used before coronary CTA?

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

149. In an entry-level CT setting, why may nitroglycerin be administered before coronary CTA?

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

150. In an entry-level CT setting, 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. Ignore intervening vessels
- D. Avoid critical structures while reaching the lesion

151. In an entry-level CT setting, which position can help distinguish mobile pleural fluid from fixed pleural thickening?

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

152. In an entry-level CT setting, what is the principal advantage of prone imaging for suspected ureterovesical junction stone?

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

153. In an entry-level CT setting, which finding suggests small-bowel obstruction?

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

154. In an entry-level CT setting, which structure is normally located in the right lower quadrant near the cecum?

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

155. In an entry-level CT setting, for orbital trauma, which reconstruction is particularly useful for the orbital floor?

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

156. In an entry-level CT setting, which CT appearance is typical of an acute subdural hematoma?

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

157. In an entry-level CT setting, which CT appearance is typical of an acute epidural hematoma?

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

158. In an entry-level CT setting, what scan phase best evaluates active arterial bleeding after trauma?

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

159. In an entry-level CT setting, which finding suggests splenic laceration?

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

160. In an entry-level CT setting, for extremity trauma, why are thin isotropic data valuable?

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

161. In an entry-level CT setting, which phase is commonly used for routine evaluation of most abdominal solid organs?

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

162. In an entry-level CT setting, which contrast route is used for CT arthrography?

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

163. In an entry-level CT setting, after CT myelography, where is contrast located?

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

164. In an entry-level CT setting, for a soft-tissue neck CT with contrast, what coverage is commonly needed?

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

165. For quality-focused practice, 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. A sagittal plane through one orbit
- C. An axial plane through the maxillary teeth
- D. A plane parallel to the supraorbitomeatal line

Practice Exam 5: 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. 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.

3. B — 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.

4. D — 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. 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.

6. 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.

7. C — 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. 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.

9. A — 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.

10. A — 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.

11. D — 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.

12. B — 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.

13. 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.

14. C — 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.

15. 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.

16. A — 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.

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18. A — 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.

19. 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.

20. 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.

21. D — 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. B — CTDIvol 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.

23. D — DLP equals CTDIvol 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.

24. 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.

25. A — 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.

26. 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.

27. D — 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.

28. B — 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.

29. A — 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.

30. D — 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.

31. C — 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.

32. B — 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.

33. A — 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.

34. 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.

35. C — 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. 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.

37. D — CTDIvol 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.

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

42. 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.

43. C — 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.

44. 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.

45. 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.

46. C — 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.

47. D — 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.

48. B — 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.

49. 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.

50. C — 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.

51. 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.

52. D — 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.

53. A — 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. C — 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.

55. 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.

56. D — 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.

57. 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.

58. 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.

59. 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.

60. 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.

61. 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.

62. D — 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.

63. 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.

64. 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.

65. 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.

66. 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.

67. A — 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.

68. B — 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.

69. D — 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.

70. 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.

71. 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.

72. A — 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.

73. B — 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.

74. B — 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.

75. D — 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.

76. A — 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.

77. C — 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. C — 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.

79. 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.

80. D — 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.

81. 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.

82. 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.

83. D — 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.

84. B — 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.

85. 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.

86. 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.

87. A — 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.

88. 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.

89. 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.

90. 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.

91. 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.

92. B — 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.

93. 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.

94. B — 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.

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