

PRACTICE EXAM 6: ARRT RADIOGRAPHY SIMULATION

(200 QUESTIONS)

This standalone practice examination contains 200 four-option questions aligned to the ARRT Radiography content specifications effective through February 28, 2027. Allow approximately 3.5 hours. Select the single best answer for each question. ARRT reports a scaled score from 1 to 99; a total scaled score of 75 is passing and is not equivalent to 75 percent correct. The ARRT blueprint changes on March 1, 2027, so candidates testing on or after that date should also review the updated specifications.

1. Before transferring a patient from a wheelchair to the radiographic table, what should the technologist do first?

- A. Raise the table to its highest position
- B. Ask the patient to stand without assistance
- C. Lock the wheelchair brakes and move the footrests
- D. Remove the patient's identification band

2. Which action best verifies a patient's identity before an examination?

- A. Confirm only the room number
- B. Ask another patient to identify the person
- C. Rely solely on the requisition photograph
- D. Use two identifiers, such as full name and date of birth

3. A patient becomes pale and dizzy while standing for an upright chest image. What is the priority response?

- A. Support the patient and place the patient in a safe position
- B. Complete the exposure before assisting
- C. Leave to locate the referring physician

D. Ask the patient to remain standing quietly

4. Which communication technique is most appropriate for a patient with hearing impairment?

- A. Speak rapidly from behind the patient
- B. Face the patient, speak clearly, and confirm understanding
- C. Use only technical terminology
- D. Avoid written instructions entirely

5. After a needlestick injury, what should the technologist do first?

- A. Wait for symptoms before reporting
- B. Apply caustic disinfectant to the wound
- C. Discard the device and continue working silently
- D. Wash the area and report the exposure immediately

6. Which finding most strongly suggests an immediate allergic-like reaction to iodinated contrast?

- A. A mild metallic taste alone
- B. Wheezing with facial swelling
- C. Brief warmth at the injection site
- D. A delayed small bruise near the vein

7. For a patient under contact precautions, which personal protective equipment is generally required on room entry?

- A. Gown and gloves
- B. Sterile gloves only
- C. Lead apron and thyroid collar
- D. Surgical mask only

8. What is the best method for confirming that a patient understood breathing instructions?

- A. Repeat the same words more loudly
- B. Assume nodding indicates understanding
- C. Ask the patient to repeat or demonstrate the instructions
- D. Provide the instructions only after exposure

9. Which site should be assessed most closely after contrast extravasation?

- A. The injection area and distal neurovascular status
- B. Only the opposite arm
- C. The patient's scalp and pupils
- D. Only the radiographic table surface

10. When handling a patient with suspected spinal injury, which transfer principle is essential?

- A. Flex the neck to improve comfort
- B. Maintain neutral alignment while moving the body as a unit
- C. Rotate the shoulders before the pelvis
- D. Allow the patient to twist onto the table

11. In a competency assessment, before transferring a patient from a wheelchair to the radiographic table, what should the technologist do first?

- A. Ask the patient to stand without assistance
- B. Remove the patient's identification band
- C. Lock the wheelchair brakes and move the footrests
- D. Raise the table to its highest position

12. In a competency assessment, which action best verifies a patient's identity before an examination?

- A. Ask another patient to identify the person
- B. Rely solely on the requisition photograph
- C. Confirm only the room number
- D. Use two identifiers, such as full name and date of birth

13. In a competency assessment, a patient becomes pale and dizzy while standing for an upright chest image. What is the priority response?

- A. Leave to locate the referring physician
- B. Support the patient and place the patient in a safe position
- C. Ask the patient to remain standing quietly
- D. Complete the exposure before assisting

14. In a competency assessment, which communication technique is most appropriate for a patient with hearing impairment?

- A. Use only technical terminology
- B. Avoid written instructions entirely
- C. Face the patient, speak clearly, and confirm understanding
- D. Speak rapidly from behind the patient

15. In a competency assessment, after a needlestick injury, what should the technologist do first?

- A. Apply caustic disinfectant to the wound
- B. Discard the device and continue working silently
- C. Wait for symptoms before reporting
- D. Wash the area and report the exposure immediately

16. In a competency assessment, which finding most strongly suggests an immediate allergic-like reaction to iodinated contrast?

- A. Wheezing with facial swelling
- B. Brief warmth at the injection site
- C. A delayed small bruise near the vein
- D. A mild metallic taste alone

17. In a competency assessment, for a patient under contact precautions, which personal protective equipment is generally required on room entry?

- A. Lead apron and thyroid collar
- B. Gown and gloves
- C. Surgical mask only
- D. Sterile gloves only

18. In a competency assessment, what is the best method for confirming that a patient understood breathing instructions?

- A. Assume nodding indicates understanding
- B. Provide the instructions only after exposure
- C. Repeat the same words more loudly
- D. Ask the patient to repeat or demonstrate the instructions

19. In a competency assessment, which site should be assessed most closely after contrast extravasation?

- A. The injection area and distal neurovascular status
- B. The patient's scalp and pupils
- C. Only the radiographic table surface
- D. Only the opposite arm

20. In a competency assessment, when handling a patient with suspected spinal injury, which transfer principle is essential?

- A. Rotate the shoulders before the pelvis
- B. Allow the patient to twist onto the table
- C. Maintain neutral alignment while moving the body as a unit
- D. Flex the neck to improve comfort

21. For a cooperative adult patient, before transferring a patient from a wheelchair to the radiographic table, what should the technologist do first?

- A. Lock the wheelchair brakes and move the footrests
- B. Remove the patient's identification band
- C. Raise the table to its highest position
- D. Ask the patient to stand without assistance

22. For a cooperative adult patient, which action best verifies a patient's identity before an examination?

- A. Rely solely on the requisition photograph
- B. Confirm only the room number
- C. Use two identifiers, such as full name and date of birth
- D. Ask another patient to identify the person

23. For a cooperative adult patient, a patient becomes pale and dizzy while standing for an upright chest image. What is the priority response?

- A. Ask the patient to remain standing quietly
- B. Support the patient and place the patient in a safe position
- C. Complete the exposure before assisting
- D. Leave to locate the referring physician

24. For a cooperative adult patient, which communication technique is most appropriate for a patient with hearing impairment?

- A. Avoid written instructions entirely
- B. Speak rapidly from behind the patient
- C. Use only technical terminology
- D. Face the patient, speak clearly, and confirm understanding

25. For a cooperative adult patient, after a needlestick injury, what should the technologist do first?

- A. Discard the device and continue working silently
- B. Wait for symptoms before reporting
- C. Apply caustic disinfectant to the wound
- D. Wash the area and report the exposure immediately

26. For a cooperative adult patient, which finding most strongly suggests an immediate allergic-like reaction to iodinated contrast?

- A. Wheezing with facial swelling
- B. A delayed small bruise near the vein
- C. A mild metallic taste alone
- D. Brief warmth at the injection site

27. For a cooperative adult patient, for a patient under contact precautions, which personal protective equipment is generally required on room entry?

- A. Surgical mask only
- B. Sterile gloves only
- C. Gown and gloves
- D. Lead apron and thyroid collar

28. For a cooperative adult patient, what is the best method for confirming that a patient understood breathing instructions?

- A. Provide the instructions only after exposure
- B. Ask the patient to repeat or demonstrate the instructions
- C. Repeat the same words more loudly
- D. Assume nodding indicates understanding

29. For a cooperative adult patient, which site should be assessed most closely after contrast extravasation?

- A. The injection area and distal neurovascular status
- B. Only the radiographic table surface
- C. Only the opposite arm
- D. The patient's scalp and pupils

30. For a cooperative adult patient, when handling a patient with suspected spinal injury, which transfer principle is essential?

- A. Allow the patient to twist onto the table
- B. Flex the neck to improve comfort
- C. Rotate the shoulders before the pelvis
- D. Maintain neutral alignment while moving the body as a unit

31. When preparing the examination, before transferring a patient from a wheelchair to the radiographic table, what should the technologist do first?

- A. Raise the table to its highest position
- B. Ask the patient to stand without assistance
- C. Lock the wheelchair brakes and move the footrests
- D. Remove the patient's identification band

32. When preparing the examination, which action best verifies a patient's identity before an examination?

- A. Confirm only the room number
- B. Use two identifiers, such as full name and date of birth
- C. Ask another patient to identify the person
- D. Rely solely on the requisition photograph

33. When preparing the examination, a patient becomes pale and dizzy while standing for an upright chest image. What is the priority response?

- A. Complete the exposure before assisting
- B. Leave to locate the referring physician
- C. Ask the patient to remain standing quietly
- D. Support the patient and place the patient in a safe position

34. Which principle reduces occupational radiation exposure most directly?

- A. Increase fluoroscopy time
- B. Maximize distance from the radiation source
- C. Stand beside the patient without shielding
- D. Remove structural barriers

35. Where should a personnel dosimeter normally be worn during routine radiography without a protective apron?

- A. Inside a pocket below the waist
- B. On the control-panel key ring
- C. At the collar or upper torso facing the radiation source
- D. Attached to the image receptor

36. During fluoroscopy with a lead apron, where is a single personnel dosimeter commonly worn?

- A. At the collar outside the apron
- B. At the ankle inside the shoe
- C. At the waist beneath the apron only
- D. On the fluoroscopic tower

37. What is the primary purpose of collimation?

- A. Increase patient motion during the radiographic exposure
- B. Magnify every structure within the exposed anatomy
- C. Limit the irradiated field to the anatomy of interest
- D. Eliminate the need for all other protective measures

38. Which tissue is especially radiosensitive because of rapid cell division?

- A. Mature skeletal muscle
- B. Peripheral nerve tissue
- C. Dense cortical bone
- D. Red bone marrow

39. What does the ALARA principle require?

- A. Keep exposures as low as reasonably achievable
- B. Use the highest technique for every patient
- C. Avoid all medically necessary imaging
- D. Ignore dose when images appear diagnostic

40. What is the main source of occupational exposure during fluoroscopy?

- A. Visible light from the monitor
- B. Scatter radiation from the patient
- C. Ultrasound emitted by the tube

D. Magnetic fields from the table

41. Which action is most effective for reducing repeat exposures?

- A. Evaluate images only at the end of the shift
- B. Use identical factors for every body habitus
- C. Verify positioning and technique before making the exposure
- D. Accept preventable motion on the first image

42. What is the purpose of a fluoroscopic cumulative timer?

- A. Alert the operator to elapsed fluoroscopy time
- B. Automatically diagnose patient disease
- C. Measure image receptor resolution
- D. Record the patient's heart rhythm

43. Which change generally reduces patient entrance skin exposure in fluoroscopy?

- A. Move the receptor farther from the patient
- B. Keep the image receptor close to the patient
- C. Place the x-ray tube closer to the skin
- D. Increase magnification without clinical need

44. In a competency assessment, which principle reduces occupational radiation exposure most directly?

- A. Stand beside the patient without shielding
- B. Remove structural barriers
- C. Increase fluoroscopy time
- D. Maximize distance from the radiation source

45. In a competency assessment, where should a personnel dosimeter normally be worn during routine radiography without a protective apron?

- A. On the control-panel key ring
- B. Attached to the image receptor
- C. At the collar or upper torso facing the radiation source
- D. Inside a pocket below the waist

46. In a competency assessment, during fluoroscopy with a lead apron, where is a single personnel dosimeter commonly worn?

- A. At the waist beneath the apron only
- B. On the fluoroscopic tower
- C. At the ankle inside the shoe
- D. At the collar outside the apron

47. In a competency assessment, what is the primary purpose of collimation?

- A. Magnify every structure within the exposed anatomy
- B. Limit the irradiated field to the anatomy of interest
- C. Eliminate the need for all other protective measures
- D. Increase patient motion during the radiographic exposure

48. In a competency assessment, which tissue is especially radiosensitive because of rapid cell division?

- A. Red bone marrow
- B. Peripheral nerve tissue
- C. Dense cortical bone
- D. Mature skeletal muscle

49. In a competency assessment, what does the ALARA principle require?

- A. Avoid all medically necessary imaging
- B. Keep exposures as low as reasonably achievable
- C. Ignore dose when images appear diagnostic
- D. Use the highest technique for every patient

50. In a competency assessment, what is the main source of occupational exposure during fluoroscopy?

- A. Scatter radiation from the patient
- B. Ultrasound emitted by the tube
- C. Magnetic fields from the table
- D. Visible light from the monitor

51. In a competency assessment, which action is most effective for reducing repeat exposures?

- A. Use identical factors for every body habitus
- B. Accept preventable motion on the first image
- C. Verify positioning and technique before making the exposure
- D. Evaluate images only at the end of the shift

52. In a competency assessment, what is the purpose of a fluoroscopic cumulative timer?

- A. Measure image receptor resolution
- B. Record the patient's heart rhythm
- C. Automatically diagnose patient disease
- D. Alert the operator to elapsed fluoroscopy time

53. In a competency assessment, which change generally reduces patient entrance skin exposure in fluoroscopy?

- A. Place the x-ray tube closer to the skin
- B. Increase magnification without clinical need
- C. Keep the image receptor close to the patient
- D. Move the receptor farther from the patient

54. For a cooperative adult patient, which principle reduces occupational radiation exposure most directly?

- A. Remove structural barriers
- B. Maximize distance from the radiation source
- C. Increase fluoroscopy time
- D. Stand beside the patient without shielding

55. For a cooperative adult patient, where should a personnel dosimeter normally be worn during routine radiography without a protective apron?

- A. At the collar or upper torso facing the radiation source
- B. Attached to the image receptor
- C. Inside a pocket below the waist
- D. On the control-panel key ring

56. For a cooperative adult patient, during fluoroscopy with a lead apron, where is a single personnel dosimeter commonly worn?

- A. On the fluoroscopic tower
- B. At the ankle inside the shoe
- C. At the waist beneath the apron only
- D. At the collar outside the apron

57. For a cooperative adult patient, what is the primary purpose of collimation?

- A. Limit the irradiated field to the anatomy of interest
- B. Eliminate the need for all other protective measures
- C. Increase patient motion during the radiographic exposure
- D. Magnify every structure within the exposed anatomy

58. For a cooperative adult patient, which tissue is especially radiosensitive because of rapid cell division?

- A. Dense cortical bone
- B. Mature skeletal muscle
- C. Peripheral nerve tissue
- D. Red bone marrow

59. For a cooperative adult patient, what does the ALARA principle require?

- A. Ignore dose when images appear diagnostic
- B. Keep exposures as low as reasonably achievable
- C. Use the highest technique for every patient
- D. Avoid all medically necessary imaging

60. For a cooperative adult patient, what is the main source of occupational exposure during fluoroscopy?

- A. Magnetic fields from the table
- B. Visible light from the monitor
- C. Scatter radiation from the patient
- D. Ultrasound emitted by the tube

61. For a cooperative adult patient, which action is most effective for reducing repeat exposures?

- A. Verify positioning and technique before making the exposure

- B. Accept preventable motion on the first image
- C. Evaluate images only at the end of the shift
- D. Use identical factors for every body habitus

62. For a cooperative adult patient, what is the purpose of a fluoroscopic cumulative timer?

- A. Record the patient's heart rhythm
- B. Automatically diagnose patient disease
- C. Alert the operator to elapsed fluoroscopy time
- D. Measure image receptor resolution

63. For a cooperative adult patient, which change generally reduces patient entrance skin exposure in fluoroscopy?

- A. Increase magnification without clinical need
- B. Move the receptor farther from the patient
- C. Place the x-ray tube closer to the skin
- D. Keep the image receptor close to the patient

64. When preparing the examination, which principle reduces occupational radiation exposure most directly?

- A. Increase fluoroscopy time
- B. Maximize distance from the radiation source
- C. Stand beside the patient without shielding
- D. Remove structural barriers

65. When preparing the examination, where should a personnel dosimeter normally be worn during routine radiography without a protective apron?

- A. Inside a pocket below the waist

- B. On the control-panel key ring
- C. Attached to the image receptor
- D. At the collar or upper torso facing the radiation source

66. When preparing the examination, during fluoroscopy with a lead apron, where is a single personnel dosimeter commonly worn?

- A. At the collar outside the apron
- B. At the ankle inside the shoe
- C. At the waist beneath the apron only
- D. On the fluoroscopic tower

67. When preparing the examination, what is the primary purpose of collimation?

- A. Increase patient motion during the radiographic exposure
- B. Magnify every structure within the exposed anatomy
- C. Limit the irradiated field to the anatomy of interest
- D. Eliminate the need for all other protective measures

68. When preparing the examination, which tissue is especially radiosensitive because of rapid cell division?

- A. Mature skeletal muscle
- B. Red bone marrow
- C. Peripheral nerve tissue
- D. Dense cortical bone

69. When preparing the examination, what does the ALARA principle require?

- A. Use the highest technique for every patient
- B. Avoid all medically necessary imaging

- C. Ignore dose when images appear diagnostic
- D. Keep exposures as low as reasonably achievable

70. When preparing the examination, what is the main source of occupational exposure during fluoroscopy?

- A. Visible light from the monitor
- B. Scatter radiation from the patient
- C. Ultrasound emitted by the tube
- D. Magnetic fields from the table

71. When preparing the examination, which action is most effective for reducing repeat exposures?

- A. Evaluate images only at the end of the shift
- B. Use identical factors for every body habitus
- C. Verify positioning and technique before making the exposure
- D. Accept preventable motion on the first image

72. When preparing the examination, what is the purpose of a fluoroscopic cumulative timer?

- A. Alert the operator to elapsed fluoroscopy time
- B. Automatically diagnose patient disease
- C. Measure image receptor resolution
- D. Record the patient's heart rhythm

73. When preparing the examination, which change generally reduces patient entrance skin exposure in fluoroscopy?

- A. Move the receptor farther from the patient
- B. Keep the image receptor close to the patient
- C. Place the x-ray tube closer to the skin

D. Increase magnification without clinical need

74. To follow standard practice, which principle reduces occupational radiation exposure most directly?

- A. Stand beside the patient without shielding
- B. Remove structural barriers
- C. Maximize distance from the radiation source
- D. Increase fluoroscopy time

75. To follow standard practice, where should a personnel dosimeter normally be worn during routine radiography without a protective apron?

- A. At the collar or upper torso facing the radiation source
- B. On the control-panel key ring
- C. Attached to the image receptor
- D. Inside a pocket below the waist

76. To follow standard practice, during fluoroscopy with a lead apron, where is a single personnel dosimeter commonly worn?

- A. At the waist beneath the apron only
- B. On the fluoroscopic tower
- C. At the ankle inside the shoe
- D. At the collar outside the apron

77. To follow standard practice, what is the primary purpose of collimation?

- A. Magnify every structure within the exposed anatomy
- B. Eliminate the need for all other protective measures
- C. Limit the irradiated field to the anatomy of interest
- D. Increase patient motion during the radiographic exposure

78. To follow standard practice, which tissue is especially radiosensitive because of rapid cell division?

- A. Peripheral nerve tissue
- B. Red bone marrow
- C. Dense cortical bone
- D. Mature skeletal muscle

79. To follow standard practice, what does the ALARA principle require?

- A. Keep exposures as low as reasonably achievable
- B. Avoid all medically necessary imaging
- C. Ignore dose when images appear diagnostic
- D. Use the highest technique for every patient

80. To follow standard practice, what is the main source of occupational exposure during fluoroscopy?

- A. Ultrasound emitted by the tube
- B. Magnetic fields from the table
- C. Visible light from the monitor
- D. Scatter radiation from the patient

81. To follow standard practice, which action is most effective for reducing repeat exposures?

- A. Use identical factors for every body habitus
- B. Verify positioning and technique before making the exposure
- C. Accept preventable motion on the first image
- D. Evaluate images only at the end of the shift

82. To follow standard practice, what is the purpose of a fluoroscopic cumulative timer?

- A. Measure image receptor resolution
- B. Record the patient's heart rhythm
- C. Automatically diagnose patient disease
- D. Alert the operator to elapsed fluoroscopy time

83. To follow standard practice, which change generally reduces patient entrance skin exposure in fluoroscopy?

- A. Place the x-ray tube closer to the skin
- B. Increase magnification without clinical need
- C. Keep the image receptor close to the patient
- D. Move the receptor farther from the patient

84. What is the primary effect of increasing mAs while other factors remain unchanged?

- A. More receptor exposure and greater image signal
- B. Lower photon quantity and more noise
- C. Shorter source-to-image distance
- D. Less radiation reaching the detector

85. What is the primary effect of increasing kVp?

- A. Lower average photon energy
- B. Complete elimination of scatter
- C. Automatic reduction of field size
- D. Greater beam penetration and higher photon energy

86. Which condition most commonly produces quantum mottle in a digital image?

- A. Insufficient exposure reaching the detector
- B. Excessive detector signal
- C. A perfectly centered anatomy
- D. An accurately collimated field

87. What does spatial resolution describe?

- A. The total number of patient identifiers
- B. The ability to display small objects separately
- C. The amount of contrast medium injected
- D. The duration of fluoroscopy

88. Which geometric factor increases magnification?

- A. Decreasing object-to-receptor distance
- B. Increasing source-to-image distance
- C. Increasing object-to-image receptor distance
- D. Placing anatomy directly on the receptor

89. What is the function of automatic exposure control?

- A. Choose the patient's diagnosis
- B. Terminate the exposure after adequate detector radiation is received
- C. Position the central ray automatically
- D. Remove all scattered radiation

90. What is the purpose of a radiographic grid?

- A. Absorb scatter before it reaches the detector
- B. Increase the amount of scatter produced
- C. Replace accurate beam centering

D. Eliminate all patient exposure

91. Which error can cause grid cutoff across the entire image with a focused grid?

- A. Using the correct focal distance
- B. Centering perpendicular to the grid
- C. Placing the anatomy near the receptor
- D. Using the grid upside down

92. What does window width primarily control on a displayed digital image?

- A. The patient's physical position
- B. The x-ray tube focal spot size
- C. The range of values represented as shades of gray
- D. The amount of contrast injected

93. What does window level primarily control?

- A. The detector's physical dimensions
- B. The duration of the examination
- C. The midpoint brightness of the displayed gray range
- D. The patient's respiratory rate

94. In a competency assessment, what is the primary effect of increasing mAs while other factors remain unchanged?

- A. More receptor exposure and greater image signal
- B. Shorter source-to-image distance
- C. Less radiation reaching the detector
- D. Lower photon quantity and more noise

95. In a competency assessment, what is the primary effect of increasing kVp?

- A. Complete elimination of scatter
- B. Automatic reduction of field size
- C. Lower average photon energy
- D. Greater beam penetration and higher photon energy

96. In a competency assessment, which condition most commonly produces quantum mottle in a digital image?

- A. A perfectly centered anatomy
- B. Insufficient exposure reaching the detector
- C. An accurately collimated field
- D. Excessive detector signal

97. In a competency assessment, what does spatial resolution describe?

- A. The amount of contrast medium injected
- B. The duration of fluoroscopy
- C. The total number of patient identifiers
- D. The ability to display small objects separately

98. In a competency assessment, which geometric factor increases magnification?

- A. Increasing object-to-image receptor distance
- B. Increasing source-to-image distance
- C. Placing anatomy directly on the receptor
- D. Decreasing object-to-receptor distance

99. In a competency assessment, what is the function of automatic exposure control?

- A. Position the central ray automatically
- B. Terminate the exposure after adequate detector radiation is received
- C. Remove all scattered radiation
- D. Choose the patient's diagnosis

100. In a competency assessment, what is the purpose of a radiographic grid?

- A. Replace accurate beam centering
- B. Eliminate all patient exposure
- C. Absorb scatter before it reaches the detector
- D. Increase the amount of scatter produced

101. In a competency assessment, which error can cause grid cutoff across the entire image with a focused grid?

- A. Centering perpendicular to the grid
- B. Placing the anatomy near the receptor
- C. Using the correct focal distance
- D. Using the grid upside down

102. In a competency assessment, what does window width primarily control on a displayed digital image?

- A. The x-ray tube focal spot size
- B. The range of values represented as shades of gray
- C. The amount of contrast injected
- D. The patient's physical position

103. In a competency assessment, what does window level primarily control?

- A. The midpoint brightness of the displayed gray range
- B. The duration of the examination
- C. The patient's respiratory rate
- D. The detector's physical dimensions

104. For a cooperative adult patient, what is the primary effect of increasing mAs while other factors remain unchanged?

- A. Less radiation reaching the detector
- B. Lower photon quantity and more noise
- C. More receptor exposure and greater image signal
- D. Shorter source-to-image distance

105. For a cooperative adult patient, what is the primary effect of increasing kVp?

- A. Automatic reduction of field size
- B. Lower average photon energy
- C. Greater beam penetration and higher photon energy
- D. Complete elimination of scatter

106. For a cooperative adult patient, which condition most commonly produces quantum mottle in a digital image?

- A. An accurately collimated field
- B. Insufficient exposure reaching the detector
- C. Excessive detector signal
- D. A perfectly centered anatomy

107. For a cooperative adult patient, what does spatial resolution describe?

- A. The ability to display small objects separately

- B. The duration of fluoroscopy
- C. The total number of patient identifiers
- D. The amount of contrast medium injected

108. For a cooperative adult patient, which geometric factor increases magnification?

- A. Placing anatomy directly on the receptor
- B. Decreasing object-to-receptor distance
- C. Increasing source-to-image distance
- D. Increasing object-to-image receptor distance

109. For a cooperative adult patient, what is the function of automatic exposure control?

- A. Remove all scattered radiation
- B. Choose the patient's diagnosis
- C. Position the central ray automatically
- D. Terminate the exposure after adequate detector radiation is received

110. For a cooperative adult patient, what is the purpose of a radiographic grid?

- A. Eliminate all patient exposure
- B. Absorb scatter before it reaches the detector
- C. Increase the amount of scatter produced
- D. Replace accurate beam centering

111. For a cooperative adult patient, which error can cause grid cutoff across the entire image with a focused grid?

- A. Placing the anatomy near the receptor
- B. Using the correct focal distance
- C. Using the grid upside down

D. Centering perpendicular to the grid

112. For a cooperative adult patient, what does window width primarily control on a displayed digital image?

- A. The range of values represented as shades of gray
- B. The amount of contrast injected
- C. The patient's physical position
- D. The x-ray tube focal spot size

113. For a cooperative adult patient, what does window level primarily control?

- A. The midpoint brightness of the displayed gray range
- B. The patient's respiratory rate
- C. The detector's physical dimensions
- D. The duration of the examination

114. When preparing the examination, what is the primary effect of increasing mAs while other factors remain unchanged?

- A. Lower photon quantity and more noise
- B. Shorter source-to-image distance
- C. More receptor exposure and greater image signal
- D. Less radiation reaching the detector

115. When preparing the examination, what is the primary effect of increasing kVp?

- A. Lower average photon energy
- B. Complete elimination of scatter
- C. Automatic reduction of field size
- D. Greater beam penetration and higher photon energy

116. When preparing the examination, which condition most commonly produces quantum mottle in a digital image?

- A. Excessive detector signal
- B. Insufficient exposure reaching the detector
- C. A perfectly centered anatomy
- D. An accurately collimated field

117. When preparing the examination, what does spatial resolution describe?

- A. The ability to display small objects separately
- B. The total number of patient identifiers
- C. The amount of contrast medium injected
- D. The duration of fluoroscopy

118. When preparing the examination, which geometric factor increases magnification?

- A. Decreasing object-to-receptor distance
- B. Increasing source-to-image distance
- C. Placing anatomy directly on the receptor
- D. Increasing object-to-image receptor distance

119. When preparing the examination, what is the function of automatic exposure control?

- A. Choose the patient's diagnosis
- B. Terminate the exposure after adequate detector radiation is received
- C. Position the central ray automatically
- D. Remove all scattered radiation

120. When preparing the examination, what is the purpose of a radiographic grid?

- A. Increase the amount of scatter produced
- B. Replace accurate beam centering
- C. Absorb scatter before it reaches the detector
- D. Eliminate all patient exposure

121. When preparing the examination, which error can cause grid cutoff across the entire image with a focused grid?

- A. Using the grid upside down
- B. Using the correct focal distance
- C. Centering perpendicular to the grid
- D. Placing the anatomy near the receptor

122. When preparing the examination, what does window width primarily control on a displayed digital image?

- A. The patient's physical position
- B. The range of values represented as shades of gray
- C. The x-ray tube focal spot size
- D. The amount of contrast injected

123. When preparing the examination, what does window level primarily control?

- A. The detector's physical dimensions
- B. The duration of the examination
- C. The patient's respiratory rate
- D. The midpoint brightness of the displayed gray range

124. To follow standard practice, what is the primary effect of increasing mAs while other factors remain unchanged?

- A. Shorter source-to-image distance
- B. Less radiation reaching the detector
- C. More receptor exposure and greater image signal
- D. Lower photon quantity and more noise

125. To follow standard practice, what is the primary effect of increasing kVp?

- A. Complete elimination of scatter
- B. Automatic reduction of field size
- C. Greater beam penetration and higher photon energy
- D. Lower average photon energy

126. To follow standard practice, which condition most commonly produces quantum mottle in a digital image?

- A. A perfectly centered anatomy
- B. An accurately collimated field
- C. Excessive detector signal
- D. Insufficient exposure reaching the detector

127. To follow standard practice, what does spatial resolution describe?

- A. The amount of contrast medium injected
- B. The ability to display small objects separately
- C. The duration of fluoroscopy
- D. The total number of patient identifiers

128. To follow standard practice, which geometric factor increases magnification?

- A. Increasing object-to-image receptor distance
- B. Increasing source-to-image distance
- C. Placing anatomy directly on the receptor
- D. Decreasing object-to-receptor distance

129. To follow standard practice, what is the function of automatic exposure control?

- A. Terminate the exposure after adequate detector radiation is received
- B. Position the central ray automatically
- C. Remove all scattered radiation
- D. Choose the patient's diagnosis

130. To follow standard practice, what is the purpose of a radiographic grid?

- A. Replace accurate beam centering
- B. Eliminate all patient exposure
- C. Increase the amount of scatter produced
- D. Absorb scatter before it reaches the detector

131. To follow standard practice, which error can cause grid cutoff across the entire image with a focused grid?

- A. Centering perpendicular to the grid
- B. Placing the anatomy near the receptor
- C. Using the grid upside down
- D. Using the correct focal distance

132. To follow standard practice, what does window width primarily control on a displayed digital image?

- A. The x-ray tube focal spot size
- B. The range of values represented as shades of gray
- C. The amount of contrast injected
- D. The patient's physical position

133. To follow standard practice, what does window level primarily control?

- A. The duration of the examination
- B. The patient's respiratory rate
- C. The detector's physical dimensions
- D. The midpoint brightness of the displayed gray range

134. During routine imaging, what is the primary effect of increasing mAs while other factors remain unchanged?

- A. Less radiation reaching the detector
- B. Lower photon quantity and more noise
- C. More receptor exposure and greater image signal
- D. Shorter source-to-image distance

135. For a PA chest radiograph, where is the central ray directed?

- A. Toward the iliac crest at L4
- B. Perpendicular to the level of T7
- C. Through the greater trochanter
- D. At the mandibular symphysis

136. Why is the PA projection preferred over AP for an ambulatory chest examination?

- A. It reduces apparent heart magnification
- B. It deliberately enlarges the mediastinum

- C. It places the scapulae over the lungs
- D. It requires a shorter source distance

137. Which breathing instruction is used for a routine PA chest exposure?

- A. Suspend after forceful expiration
- B. Continue shallow breathing during exposure
- C. Suspend after the second full inspiration
- D. Perform a Valsalva maneuver

138. For an AP supine abdomen, where is the central ray centered?

- A. At T7 near the scapular angles
- B. At the femoral neck
- C. At the external auditory meatus
- D. At the level of the iliac crests

139. Which projection best demonstrates free intraperitoneal air when the patient cannot stand?

- A. Right lateral decubitus with a vertical beam
- B. Left lateral decubitus abdomen with a horizontal beam
- C. AP supine abdomen only
- D. Prone abdomen with an angled beam

140. For an AP pelvis, how are the legs positioned when trauma is not suspected?

- A. Internally rotate both legs about 15 to 20 degrees
- B. Externally rotate both legs 45 degrees
- C. Flex both knees sharply
- D. Cross one ankle over the other

141. Which projection demonstrates the intercondylar fossa of the knee?

- A. A routine AP ankle projection
- B. A tunnel or notch projection
- C. A tangential patella only
- D. A lateral elbow projection

142. Which projection best demonstrates the scaphoid without superimposition?

- A. AP forearm with elbow flexed
- B. Lateral hand with fingers extended
- C. Oblique elbow with external rotation
- D. PA wrist with ulnar deviation

143. For a lateral cervical spine, where is the central ray directed?

- A. Vertically to the iliac crest
- B. Toward T7 with a caudal angle
- C. Horizontally to the level of C4
- D. Through the femoral condyles

144. Which position opens the zygapophyseal joints of the lumbar spine?

- A. A 45-degree posterior oblique position
- B. A true AP position without rotation
- C. A lateral knee position
- D. A PA chest position

145. For a lateral lumbar spine, what helps reduce superimposition from waist sag?

- A. Rotate the pelvis toward an AP position
- B. Flex the neck as far as possible
- C. Elevate only the upper shoulder
- D. Place radiolucent support under the waist when needed

146. Which projection demonstrates the odontoid through the open mouth?

- A. AP open-mouth projection of C1 and C2
- B. PA axial skull projection
- C. Lateral lumbar projection
- D. AP oblique foot projection

147. For an AP axial clavicle, how is the central ray commonly angled?

- A. Caudad to project it below the thorax
- B. Horizontally toward the knee
- C. Cephalad to project the clavicle above the ribs
- D. Perpendicular to the ankle mortise

148. Which position is used for a routine lateral hip when fracture is not suspected?

- A. Internally rotate both legs without flexion
- B. Flex the knee and externally rotate the affected thigh
- C. Keep the affected leg fully extended in trauma
- D. Turn the patient prone with feet together

149. Which projection is preferred for a suspected hip fracture without moving the affected leg?

- A. Horizontal-beam cross-table lateral hip
- B. Frog-leg lateral hip
- C. Weight-bearing AP knee

D. Tangential patella projection

150. In a competency assessment, for a PA chest radiograph, where is the central ray directed?

- A. Through the greater trochanter
- B. At the mandibular symphysis
- C. Perpendicular to the level of T7
- D. Toward the iliac crest at L4

151. In a competency assessment, why is the PA projection preferred over AP for an ambulatory chest examination?

- A. It places the scapulae over the lungs
- B. It reduces apparent heart magnification
- C. It requires a shorter source distance
- D. It deliberately enlarges the mediastinum

152. In a competency assessment, which breathing instruction is used for a routine PA chest exposure?

- A. Continue shallow breathing during exposure
- B. Perform a Valsalva maneuver
- C. Suspend after forceful expiration
- D. Suspend after the second full inspiration

153. In a competency assessment, for an AP supine abdomen, where is the central ray centered?

- A. At the femoral neck
- B. At the external auditory meatus
- C. At the level of the iliac crests
- D. At T7 near the scapular angles

154. In a competency assessment, which projection best demonstrates free intraperitoneal air when the patient cannot stand?

- A. AP supine abdomen only
- B. Prone abdomen with an angled beam
- C. Right lateral decubitus with a vertical beam
- D. Left lateral decubitus abdomen with a horizontal beam

155. In a competency assessment, for an AP pelvis, how are the legs positioned when trauma is not suspected?

- A. Flex both knees sharply
- B. Internally rotate both legs about 15 to 20 degrees
- C. Cross one ankle over the other
- D. Externally rotate both legs 45 degrees

156. In a competency assessment, which projection demonstrates the intercondylar fossa of the knee?

- A. A tunnel or notch projection
- B. A tangential patella only
- C. A lateral elbow projection
- D. A routine AP ankle projection

157. In a competency assessment, which projection best demonstrates the scaphoid without superimposition?

- A. Lateral hand with fingers extended
- B. Oblique elbow with external rotation
- C. PA wrist with ulnar deviation
- D. AP forearm with elbow flexed

158. In a competency assessment, for a lateral cervical spine, where is the central ray directed?

- A. Toward T7 with a caudal angle
- B. Through the femoral condyles
- C. Vertically to the iliac crest
- D. Horizontally to the level of C4

159. In a competency assessment, which position opens the zygapophyseal joints of the lumbar spine?

- A. A lateral knee position
- B. A 45-degree posterior oblique position
- C. A PA chest position
- D. A true AP position without rotation

160. In a competency assessment, for a lateral lumbar spine, what helps reduce superimposition from waist sag?

- A. Flex the neck as far as possible
- B. Place radiolucent support under the waist when needed
- C. Elevate only the upper shoulder
- D. Rotate the pelvis toward an AP position

161. In a competency assessment, which projection demonstrates the odontoid through the open mouth?

- A. AP open-mouth projection of C1 and C2
- B. Lateral lumbar projection
- C. AP oblique foot projection
- D. PA axial skull projection

162. In a competency assessment, for an AP axial clavicle, how is the central ray commonly angled?

- A. Horizontally toward the knee
- B. Perpendicular to the ankle mortise
- C. Caudad to project it below the thorax
- D. Cephalad to project the clavicle above the ribs

163. In a competency assessment, which position is used for a routine lateral hip when fracture is not suspected?

- A. Keep the affected leg fully extended in trauma
- B. Turn the patient prone with feet together
- C. Flex the knee and externally rotate the affected thigh
- D. Internally rotate both legs without flexion

164. In a competency assessment, which projection is preferred for a suspected hip fracture without moving the affected leg?

- A. Horizontal-beam cross-table lateral hip
- B. Weight-bearing AP knee
- C. Tangential patella projection
- D. Frog-leg lateral hip

165. For a cooperative adult patient, for a PA chest radiograph, where is the central ray directed?

- A. At the mandibular symphysis
- B. Toward the iliac crest at L4
- C. Through the greater trochanter
- D. Perpendicular to the level of T7

166. For a cooperative adult patient, why is the PA projection preferred over AP for an ambulatory chest examination?

- A. It requires a shorter source distance
- B. It reduces apparent heart magnification
- C. It deliberately enlarges the mediastinum
- D. It places the scapulae over the lungs

167. For a cooperative adult patient, which breathing instruction is used for a routine PA chest exposure?

- A. Suspend after the second full inspiration
- B. Perform a Valsalva maneuver
- C. Suspend after forceful expiration
- D. Continue shallow breathing during exposure

168. For a cooperative adult patient, for an AP supine abdomen, where is the central ray centered?

- A. At the external auditory meatus
- B. At T7 near the scapular angles
- C. At the level of the iliac crests
- D. At the femoral neck

169. For a cooperative adult patient, which projection best demonstrates free intraperitoneal air when the patient cannot stand?

- A. Left lateral decubitus abdomen with a horizontal beam
- B. Prone abdomen with an angled beam
- C. Right lateral decubitus with a vertical beam
- D. AP supine abdomen only

170. For a cooperative adult patient, for an AP pelvis, how are the legs positioned when trauma is not suspected?

- A. Cross one ankle over the other
- B. Externally rotate both legs 45 degrees
- C. Flex both knees sharply
- D. Internally rotate both legs about 15 to 20 degrees

171. For a cooperative adult patient, which projection demonstrates the intercondylar fossa of the knee?

- A. A lateral elbow projection
- B. A routine AP ankle projection
- C. A tunnel or notch projection
- D. A tangential patella only

172. For a cooperative adult patient, which projection best demonstrates the scaphoid without superimposition?

- A. Oblique elbow with external rotation
- B. PA wrist with ulnar deviation
- C. AP forearm with elbow flexed
- D. Lateral hand with fingers extended

173. For a cooperative adult patient, for a lateral cervical spine, where is the central ray directed?

- A. Horizontally to the level of C4
- B. Through the femoral condyles
- C. Vertically to the iliac crest
- D. Toward T7 with a caudal angle

174. For a cooperative adult patient, which position opens the zygapophyseal joints of the lumbar spine?

- A. A PA chest position
- B. A true AP position without rotation
- C. A lateral knee position
- D. A 45-degree posterior oblique position

175. For a cooperative adult patient, for a lateral lumbar spine, what helps reduce superimposition from waist sag?

- A. Elevate only the upper shoulder
- B. Rotate the pelvis toward an AP position
- C. Place radiolucent support under the waist when needed
- D. Flex the neck as far as possible

176. For a cooperative adult patient, which projection demonstrates the odontoid through the open mouth?

- A. AP oblique foot projection
- B. PA axial skull projection
- C. AP open-mouth projection of C1 and C2
- D. Lateral lumbar projection

177. For a cooperative adult patient, for an AP axial clavicle, how is the central ray commonly angled?

- A. Perpendicular to the ankle mortise
- B. Cephalad to project the clavicle above the ribs
- C. Caudad to project it below the thorax
- D. Horizontally toward the knee

178. For a cooperative adult patient, which position is used for a routine lateral hip when fracture is not suspected?

- A. Flex the knee and externally rotate the affected thigh
- B. Turn the patient prone with feet together
- C. Internally rotate both legs without flexion
- D. Keep the affected leg fully extended in trauma

179. For a cooperative adult patient, which projection is preferred for a suspected hip fracture without moving the affected leg?

- A. Tangential patella projection
- B. Frog-leg lateral hip
- C. Weight-bearing AP knee
- D. Horizontal-beam cross-table lateral hip

180. When preparing the examination, for a PA chest radiograph, where is the central ray directed?

- A. Toward the iliac crest at L4
- B. Perpendicular to the level of T7
- C. Through the greater trochanter
- D. At the mandibular symphysis

181. When preparing the examination, why is the PA projection preferred over AP for an ambulatory chest examination?

- A. It reduces apparent heart magnification
- B. It deliberately enlarges the mediastinum
- C. It places the scapulae over the lungs
- D. It requires a shorter source distance

182. When preparing the examination, which breathing instruction is used for a routine PA chest exposure?

- A. Suspend after forceful expiration
- B. Continue shallow breathing during exposure
- C. Perform a Valsalva maneuver
- D. Suspend after the second full inspiration

183. When preparing the examination, for an AP supine abdomen, where is the central ray centered?

- A. At T7 near the scapular angles
- B. At the femoral neck
- C. At the level of the iliac crests
- D. At the external auditory meatus

184. When preparing the examination, which projection best demonstrates free intraperitoneal air when the patient cannot stand?

- A. Right lateral decubitus with a vertical beam
- B. Left lateral decubitus abdomen with a horizontal beam
- C. AP supine abdomen only
- D. Prone abdomen with an angled beam

185. When preparing the examination, for an AP pelvis, how are the legs positioned when trauma is not suspected?

- A. Externally rotate both legs 45 degrees
- B. Internally rotate both legs about 15 to 20 degrees
- C. Flex both knees sharply
- D. Cross one ankle over the other

186. When preparing the examination, which projection demonstrates the intercondylar fossa of the knee?

- A. A routine AP ankle projection
- B. A tangential patella only
- C. A tunnel or notch projection
- D. A lateral elbow projection

187. When preparing the examination, which projection best demonstrates the scaphoid without superimposition?

- A. PA wrist with ulnar deviation
- B. AP forearm with elbow flexed
- C. Lateral hand with fingers extended
- D. Oblique elbow with external rotation

188. When preparing the examination, for a lateral cervical spine, where is the central ray directed?

- A. Vertically to the iliac crest
- B. Toward T7 with a caudal angle
- C. Through the femoral condyles
- D. Horizontally to the level of C4

189. When preparing the examination, which position opens the zygapophyseal joints of the lumbar spine?

- A. A true AP position without rotation
- B. A lateral knee position
- C. A 45-degree posterior oblique position
- D. A PA chest position

190. When preparing the examination, for a lateral lumbar spine, what helps reduce superimposition from waist sag?

- A. Place radiolucent support under the waist when needed
- B. Rotate the pelvis toward an AP position
- C. Flex the neck as far as possible
- D. Elevate only the upper shoulder

191. When preparing the examination, which projection demonstrates the odontoid through the open mouth?

- A. PA axial skull projection
- B. Lateral lumbar projection
- C. AP oblique foot projection
- D. AP open-mouth projection of C1 and C2

192. When preparing the examination, for an AP axial clavicle, how is the central ray commonly angled?

- A. Caudad to project it below the thorax
- B. Cephalad to project the clavicle above the ribs
- C. Horizontally toward the knee
- D. Perpendicular to the ankle mortise

193. When preparing the examination, which position is used for a routine lateral hip when fracture is not suspected?

- A. Internally rotate both legs without flexion
- B. Keep the affected leg fully extended in trauma
- C. Turn the patient prone with feet together
- D. Flex the knee and externally rotate the affected thigh

194. When preparing the examination, which projection is preferred for a suspected hip fracture without moving the affected leg?

- A. Horizontal-beam cross-table lateral hip
- B. Frog-leg lateral hip
- C. Weight-bearing AP knee
- D. Tangential patella projection

195. To follow standard practice, for a PA chest radiograph, where is the central ray directed?

- A. Through the greater trochanter
- B. Perpendicular to the level of T7
- C. At the mandibular symphysis
- D. Toward the iliac crest at L4

196. To follow standard practice, why is the PA projection preferred over AP for an ambulatory chest examination?

- A. It places the scapulae over the lungs
- B. It requires a shorter source distance
- C. It reduces apparent heart magnification
- D. It deliberately enlarges the mediastinum

197. To follow standard practice, which breathing instruction is used for a routine PA chest exposure?

- A. Suspend after the second full inspiration
- B. Continue shallow breathing during exposure
- C. Perform a Valsalva maneuver
- D. Suspend after forceful expiration

198. To follow standard practice, for an AP supine abdomen, where is the central ray centered?

- A. At the femoral neck
- B. At the level of the iliac crests

- C. At the external auditory meatus
- D. At T7 near the scapular angles

199. To follow standard practice, which projection best demonstrates free intraperitoneal air when the patient cannot stand?

- A. AP supine abdomen only
- B. Prone abdomen with an angled beam
- C. Right lateral decubitus with a vertical beam
- D. Left lateral decubitus abdomen with a horizontal beam

200. To follow standard practice, for an AP pelvis, how are the legs positioned when trauma is not suspected?

- A. Flex both knees sharply
- B. Cross one ankle over the other
- C. Internally rotate both legs about 15 to 20 degrees
- D. Externally rotate both legs 45 degrees

Practice Exam 6: Answer Key and Explanations

1. C — Locking the wheelchair and clearing the footrests stabilizes the equipment and removes a tripping hazard before the patient stands. Raising the table can worsen the transfer angle, unsupported standing increases fall risk, and the identification band must remain available for verification. Safe transfers begin by controlling the environment and equipment.

2. D — Two independent identifiers reduce wrong-patient errors and should be matched with the order before exposure. A room number is not a unique identifier, another patient is not an authoritative source, and a photograph alone may be outdated or ambiguous. Verification should occur actively with the patient whenever the patient's condition permits.

3. A — Pallor and dizziness may precede syncope, so preventing a fall and positioning the patient safely take priority. Continuing the exposure or asking the patient to remain upright increases injury risk. The

technologist should summon help after immediate stabilization, assess responsiveness and vital signs, and follow the facility emergency-response procedure. This is clinically important.

4. B — Facing the patient supports lip reading and allows visual cues, while clear speech and teach-back confirm that instructions were understood. Speaking from behind removes those cues, rapid technical language creates barriers, and written information may be helpful rather than prohibited. Communication should be adapted respectfully to the patient's preferred method and individual needs.

5. D — Immediate washing reduces surface contamination, and prompt reporting starts the occupational-exposure protocol, including risk assessment, source testing when permitted, and time-sensitive prophylaxis. Waiting for symptoms can delay effective care. Caustic chemicals can injure tissue, and silent disposal prevents documentation and follow-up. Facility policy should guide every subsequent step. This is clinically important.

6. B — Wheezing and facial swelling suggest airway involvement and require rapid assessment, emergency assistance, oxygen, and treatment under the facility protocol. A transient metallic taste or generalized warmth commonly occurs without indicating a severe reaction. A small delayed bruise is more consistent with local venipuncture trauma than an acute systemic contrast response.

7. A — Contact precautions are designed to prevent transmission by direct or indirect contact, so gown and gloves are generally donned before entering the room. Sterile gloves are unnecessary for routine contact, radiation apparel does not provide infection control, and a mask alone does not protect clothing or hands. Additional equipment depends on anticipated exposure.

8. C — Teach-back reveals whether the patient can apply the breathing directions and allows correction before imaging. Speaking louder does not solve language, hearing, or comprehension barriers. Nodding may reflect politeness rather than understanding, and delayed instruction cannot prevent motion. Clear explanation, demonstration, and confirmation improve cooperation and image quality while reducing repeats.

9. A — Extravasated contrast can cause swelling, pain, altered sensation, and impaired circulation near and beyond the injection site. Assessment therefore includes the affected area plus distal color, temperature, capillary refill, movement, and sensation. The opposite arm, scalp, and table do not reveal local tissue compromise. Document findings and follow escalation instructions.

10. B — Neutral alignment and coordinated movement as a unit limit additional displacement of a potentially unstable spine. Flexion, twisting, or moving the shoulders separately from the pelvis may worsen neurologic injury. Adequate personnel and approved transfer devices should be used, with one person directing the maneuver and monitoring alignment throughout the transfer.

11. C — Locking the wheelchair and clearing the footrests stabilizes the equipment and removes a tripping hazard before the patient stands. Raising the table can worsen the transfer angle, unsupported standing increases fall risk, and the identification band must remain available for verification. Safe transfers begin by controlling the environment and equipment.

12. D — Two independent identifiers reduce wrong-patient errors and should be matched with the order before exposure. A room number is not a unique identifier, another patient is not an authoritative source, and a photograph alone may be outdated or ambiguous. Verification should occur actively with the patient whenever the patient's condition permits.

13. B — Pallor and dizziness may precede syncope, so preventing a fall and positioning the patient safely take priority. Continuing the exposure or asking the patient to remain upright increases injury risk. The technologist should summon help after immediate stabilization, assess responsiveness and vital signs, and follow the facility emergency-response procedure. This is clinically important.

14. C — Facing the patient supports lip reading and allows visual cues, while clear speech and teach-back confirm that instructions were understood. Speaking from behind removes those cues, rapid technical language creates barriers, and written information may be helpful rather than prohibited. Communication should be adapted respectfully to the patient's preferred method and individual needs.

15. D — Immediate washing reduces surface contamination, and prompt reporting starts the occupational-exposure protocol, including risk assessment, source testing when permitted, and time-sensitive prophylaxis. Waiting for symptoms can delay effective care. Caustic chemicals can injure tissue, and silent disposal prevents documentation and follow-up. Facility policy should guide every subsequent step. This is clinically important.

16. A — Wheezing and facial swelling suggest airway involvement and require rapid assessment, emergency assistance, oxygen, and treatment under the facility protocol. A transient metallic taste or generalized warmth commonly occurs without indicating a severe reaction. A small delayed bruise is more consistent with local venipuncture trauma than an acute systemic contrast response.

17. B — Contact precautions are designed to prevent transmission by direct or indirect contact, so gown and gloves are generally donned before entering the room. Sterile gloves are unnecessary for routine contact, radiation apparel does not provide infection control, and a mask alone does not protect clothing or hands. Additional equipment depends on anticipated exposure.

18. D — Teach-back reveals whether the patient can apply the breathing directions and allows correction before imaging. Speaking louder does not solve language, hearing, or comprehension barriers. Nodding may reflect politeness rather than understanding, and delayed instruction cannot prevent motion. Clear explanation, demonstration, and confirmation improve cooperation and image quality while reducing repeats.

19. A — Extravasated contrast can cause swelling, pain, altered sensation, and impaired circulation near and beyond the injection site. Assessment therefore includes the affected area plus distal color, temperature, capillary refill, movement, and sensation. The opposite arm, scalp, and table do not reveal local tissue compromise. Document findings and follow escalation instructions.

20. C — Neutral alignment and coordinated movement as a unit limit additional displacement of a potentially unstable spine. Flexion, twisting, or moving the shoulders separately from the pelvis may

worsen neurologic injury. Adequate personnel and approved transfer devices should be used, with one person directing the maneuver and monitoring alignment throughout the transfer.

21. A — Locking the wheelchair and clearing the footrests stabilizes the equipment and removes a tripping hazard before the patient stands. Raising the table can worsen the transfer angle, unsupported standing increases fall risk, and the identification band must remain available for verification. Safe transfers begin by controlling the environment and equipment.

22. C — Two independent identifiers reduce wrong-patient errors and should be matched with the order before exposure. A room number is not a unique identifier, another patient is not an authoritative source, and a photograph alone may be outdated or ambiguous. Verification should occur actively with the patient whenever the patient's condition permits.

23. B — Pallor and dizziness may precede syncope, so preventing a fall and positioning the patient safely take priority. Continuing the exposure or asking the patient to remain upright increases injury risk. The technologist should summon help after immediate stabilization, assess responsiveness and vital signs, and follow the facility emergency-response procedure. This is clinically important.

24. D — Facing the patient supports lip reading and allows visual cues, while clear speech and teach-back confirm that instructions were understood. Speaking from behind removes those cues, rapid technical language creates barriers, and written information may be helpful rather than prohibited. Communication should be adapted respectfully to the patient's preferred method and individual needs.

25. D — Immediate washing reduces surface contamination, and prompt reporting starts the occupational-exposure protocol, including risk assessment, source testing when permitted, and time-sensitive prophylaxis. Waiting for symptoms can delay effective care. Caustic chemicals can injure tissue, and silent disposal prevents documentation and follow-up. Facility policy should guide every subsequent step. This is clinically important.

26. A — Wheezing and facial swelling suggest airway involvement and require rapid assessment, emergency assistance, oxygen, and treatment under the facility protocol. A transient metallic taste or generalized warmth commonly occurs without indicating a severe reaction. A small delayed bruise is more consistent with local venipuncture trauma than an acute systemic contrast response.

27. C — Contact precautions are designed to prevent transmission by direct or indirect contact, so gown and gloves are generally donned before entering the room. Sterile gloves are unnecessary for routine contact, radiation apparel does not provide infection control, and a mask alone does not protect clothing or hands. Additional equipment depends on anticipated exposure.

28. B — Teach-back reveals whether the patient can apply the breathing directions and allows correction before imaging. Speaking louder does not solve language, hearing, or comprehension barriers. Nodding may reflect politeness rather than understanding, and delayed instruction cannot prevent motion. Clear explanation, demonstration, and confirmation improve cooperation and image quality while reducing repeats.

29. A — Extravasated contrast can cause swelling, pain, altered sensation, and impaired circulation near and beyond the injection site. Assessment therefore includes the affected area plus distal color, temperature, capillary refill, movement, and sensation. The opposite arm, scalp, and table do not reveal local tissue compromise. Document findings and follow escalation instructions.

30. D — Neutral alignment and coordinated movement as a unit limit additional displacement of a potentially unstable spine. Flexion, twisting, or moving the shoulders separately from the pelvis may worsen neurologic injury. Adequate personnel and approved transfer devices should be used, with one person directing the maneuver and monitoring alignment throughout the transfer.

31. C — Locking the wheelchair and clearing the footrests stabilizes the equipment and removes a tripping hazard before the patient stands. Raising the table can worsen the transfer angle, unsupported standing increases fall risk, and the identification band must remain available for verification. Safe transfers begin by controlling the environment and equipment.

32. B — Two independent identifiers reduce wrong-patient errors and should be matched with the order before exposure. A room number is not a unique identifier, another patient is not an authoritative source, and a photograph alone may be outdated or ambiguous. Verification should occur actively with the patient whenever the patient's condition permits.

33. D — Pallor and dizziness may precede syncope, so preventing a fall and positioning the patient safely take priority. Continuing the exposure or asking the patient to remain upright increases injury risk. The technologist should summon help after immediate stabilization, assess responsiveness and vital signs, and follow the facility emergency-response procedure. This is clinically important.

34. B — Distance is a powerful exposure-control measure because radiation intensity decreases rapidly as distance from the source increases. Longer fluoroscopy time raises exposure, standing close to the patient increases scatter dose, and removing barriers eliminates protection. Occupational safety combines minimal time, maximal practical distance, and appropriate shielding while maintaining patient care.

35. C — The dosimeter should represent exposure to the worker's trunk and head, so collar or upper-torso placement facing the source is appropriate when no apron is worn. A pocket can shield or misrepresent exposure, while a key ring or receptor does not measure the technologist's dose. Facility policy determines exact placement.

36. A — A single badge worn at the collar outside the apron monitors exposure to the head and neck, which are not protected by the apron. An ankle badge or equipment-mounted badge does not represent occupational dose. Some programs use two badges, but single-badge placement should follow the monitoring policy and badge instructions.

37. C — Collimation restricts the beam to the required anatomy, reducing patient volume irradiated and the production of scatter radiation. Less scatter also improves image contrast. Collimation does not intentionally create motion or magnification, and it does not replace other protective practices. The light field should be accurately aligned with the radiation field.

38. D — Red bone marrow contains actively dividing hematopoietic precursor cells, making it more radiosensitive than mature muscle, peripheral nerves, or mineralized cortical bone. Radiation sensitivity generally increases with reproductive activity and decreases with cellular differentiation. Protecting marrow-rich regions and avoiding unnecessary repeats are therefore important parts of patient dose optimization. This is clinically important.

39. A — ALARA means optimizing every exposure so radiation dose is as low as reasonably achievable while still obtaining the needed diagnostic information. It does not require avoiding justified examinations or sacrificing image quality. Selecting appropriate technique, collimating closely, preventing repeats, using shielding appropriately, and maintaining equipment are practical applications of the principle.

40. B — The patient becomes the principal source of scattered x-rays during fluoroscopy after the primary beam interacts with tissue. Monitor light, ultrasound, and table magnetic fields are not the relevant ionizing-radiation sources. Staff dose is reduced through beam limitation, low-dose modes, distance, protective barriers, and appropriate positioning around the table. This is clinically important.

41. C — Pre-exposure verification catches positioning, centering, marker, and technique problems before radiation is delivered. Delayed evaluation prevents immediate correction, identical factors ignore patient attenuation, and accepting motion may make the image nondiagnostic. A consistent pause, clear instructions, immobilization when appropriate, and careful review of the order help prevent unnecessary repeats. This is clinically important.

42. A — The cumulative timer provides an audible reminder of elapsed fluoroscopy time, encouraging the operator to reassess beam-on use and limit unnecessary exposure. It does not diagnose disease, measure receptor resolution, or monitor cardiac rhythm. Dose management also includes pulsed operation, last-image hold, tight collimation, and appropriate source-to-patient geometry. This is clinically important.

43. B — Keeping the receptor close reduces the air gap and allows the system to maintain image brightness with less output than when the receptor is farther away. Bringing the tube close to the skin raises entrance exposure, while unnecessary magnification usually increases dose. Geometry should be optimized without compromising the procedure or patient safety.

44. D — Distance is a powerful exposure-control measure because radiation intensity decreases rapidly as distance from the source increases. Longer fluoroscopy time raises exposure, standing close to the patient increases scatter dose, and removing barriers eliminates protection. Occupational safety combines minimal time, maximal practical distance, and appropriate shielding while maintaining patient care.

45. C — The dosimeter should represent exposure to the worker's trunk and head, so collar or upper-torso placement facing the source is appropriate when no apron is worn. A pocket can shield or misrepresent exposure, while a key ring or receptor does not measure the technologist's dose. Facility policy determines exact placement.

46. D — A single badge worn at the collar outside the apron monitors exposure to the head and neck, which are not protected by the apron. An ankle badge or equipment-mounted badge does not represent occupational dose. Some programs use two badges, but single-badge placement should follow the monitoring policy and badge instructions.

47. B — Collimation restricts the beam to the required anatomy, reducing patient volume irradiated and the production of scatter radiation. Less scatter also improves image contrast. Collimation does not intentionally create motion or magnification, and it does not replace other protective practices. The light field should be accurately aligned with the radiation field.

48. A — Red bone marrow contains actively dividing hematopoietic precursor cells, making it more radiosensitive than mature muscle, peripheral nerves, or mineralized cortical bone. Radiation sensitivity generally increases with reproductive activity and decreases with cellular differentiation. Protecting marrow-rich regions and avoiding unnecessary repeats are therefore important parts of patient dose optimization. This is clinically important.

49. B — ALARA means optimizing every exposure so radiation dose is as low as reasonably achievable while still obtaining the needed diagnostic information. It does not require avoiding justified examinations or sacrificing image quality. Selecting appropriate technique, collimating closely, preventing repeats, using shielding appropriately, and maintaining equipment are practical applications of the principle.

50. A — The patient becomes the principal source of scattered x-rays during fluoroscopy after the primary beam interacts with tissue. Monitor light, ultrasound, and table magnetic fields are not the relevant ionizing-radiation sources. Staff dose is reduced through beam limitation, low-dose modes, distance, protective barriers, and appropriate positioning around the table. This is clinically important.

51. C — Pre-exposure verification catches positioning, centering, marker, and technique problems before radiation is delivered. Delayed evaluation prevents immediate correction, identical factors ignore patient attenuation, and accepting motion may make the image nondiagnostic. A consistent pause, clear instructions, immobilization when appropriate, and careful review of the order help prevent unnecessary repeats. This is clinically important.

52. D — The cumulative timer provides an audible reminder of elapsed fluoroscopy time, encouraging the operator to reassess beam-on use and limit unnecessary exposure. It does not diagnose disease, measure receptor resolution, or monitor cardiac rhythm. Dose management also includes pulsed operation, last-image hold, tight collimation, and appropriate source-to-patient geometry. This is clinically important.

53. C — Keeping the receptor close reduces the air gap and allows the system to maintain image brightness with less output than when the receptor is farther away. Bringing the tube close to the skin raises entrance exposure, while unnecessary magnification usually increases dose. Geometry should be optimized without compromising the procedure or patient safety.

54. B — Distance is a powerful exposure-control measure because radiation intensity decreases rapidly as distance from the source increases. Longer fluoroscopy time raises exposure, standing close to the patient increases scatter dose, and removing barriers eliminates protection. Occupational safety combines minimal time, maximal practical distance, and appropriate shielding while maintaining patient care.

55. A — The dosimeter should represent exposure to the worker's trunk and head, so collar or upper-torso placement facing the source is appropriate when no apron is worn. A pocket can shield or misrepresent exposure, while a key ring or receptor does not measure the technologist's dose. Facility policy determines exact placement.

56. D — A single badge worn at the collar outside the apron monitors exposure to the head and neck, which are not protected by the apron. An ankle badge or equipment-mounted badge does not represent occupational dose. Some programs use two badges, but single-badge placement should follow the monitoring policy and badge instructions.

57. A — Collimation restricts the beam to the required anatomy, reducing patient volume irradiated and the production of scatter radiation. Less scatter also improves image contrast. Collimation does not intentionally create motion or magnification, and it does not replace other protective practices. The light field should be accurately aligned with the radiation field.

58. D — Red bone marrow contains actively dividing hematopoietic precursor cells, making it more radiosensitive than mature muscle, peripheral nerves, or mineralized cortical bone. Radiation sensitivity generally increases with reproductive activity and decreases with cellular differentiation. Protecting marrow-rich regions and avoiding unnecessary repeats are therefore important parts of patient dose optimization. This is clinically important.

59. B — ALARA means optimizing every exposure so radiation dose is as low as reasonably achievable while still obtaining the needed diagnostic information. It does not require avoiding justified examinations or sacrificing image quality. Selecting appropriate technique, collimating closely, preventing repeats, using shielding appropriately, and maintaining equipment are practical applications of the principle.

60. C — The patient becomes the principal source of scattered x-rays during fluoroscopy after the primary beam interacts with tissue. Monitor light, ultrasound, and table magnetic fields are not the relevant ionizing-radiation sources. Staff dose is reduced through beam limitation, low-dose modes, distance, protective barriers, and appropriate positioning around the table. This is clinically important.

61. A — Pre-exposure verification catches positioning, centering, marker, and technique problems before radiation is delivered. Delayed evaluation prevents immediate correction, identical factors ignore patient attenuation, and accepting motion may make the image nondiagnostic. A consistent pause, clear instructions, immobilization when appropriate, and careful review of the order help prevent unnecessary repeats. This is clinically important.

62. C — The cumulative timer provides an audible reminder of elapsed fluoroscopy time, encouraging the operator to reassess beam-on use and limit unnecessary exposure. It does not diagnose disease, measure receptor resolution, or monitor cardiac rhythm. Dose management also includes pulsed operation, last-image hold, tight collimation, and appropriate source-to-patient geometry. This is clinically important.

63. D — Keeping the receptor close reduces the air gap and allows the system to maintain image brightness with less output than when the receptor is farther away. Bringing the tube close to the skin raises entrance exposure, while unnecessary magnification usually increases dose. Geometry should be optimized without compromising the procedure or patient safety.

64. B — Distance is a powerful exposure-control measure because radiation intensity decreases rapidly as distance from the source increases. Longer fluoroscopy time raises exposure, standing close to the patient increases scatter dose, and removing barriers eliminates protection. Occupational safety combines minimal time, maximal practical distance, and appropriate shielding while maintaining patient care.

65. D — The dosimeter should represent exposure to the worker's trunk and head, so collar or upper-torso placement facing the source is appropriate when no apron is worn. A pocket can shield or misrepresent exposure, while a key ring or receptor does not measure the technologist's dose. Facility policy determines exact placement.

66. A — A single badge worn at the collar outside the apron monitors exposure to the head and neck, which are not protected by the apron. An ankle badge or equipment-mounted badge does not represent occupational dose. Some programs use two badges, but single-badge placement should follow the monitoring policy and badge instructions.

67. C — Collimation restricts the beam to the required anatomy, reducing patient volume irradiated and the production of scatter radiation. Less scatter also improves image contrast. Collimation does not intentionally create motion or magnification, and it does not replace other protective practices. The light field should be accurately aligned with the radiation field.

68. B — Red bone marrow contains actively dividing hematopoietic precursor cells, making it more radiosensitive than mature muscle, peripheral nerves, or mineralized cortical bone. Radiation sensitivity generally increases with reproductive activity and decreases with cellular differentiation. Protecting marrow-rich regions and avoiding unnecessary repeats are therefore important parts of patient dose optimization. This is clinically important.

69. D — ALARA means optimizing every exposure so radiation dose is as low as reasonably achievable while still obtaining the needed diagnostic information. It does not require avoiding justified examinations or sacrificing image quality. Selecting appropriate technique, collimating closely, preventing repeats, using shielding appropriately, and maintaining equipment are practical applications of the principle.

70. B — The patient becomes the principal source of scattered x-rays during fluoroscopy after the primary beam interacts with tissue. Monitor light, ultrasound, and table magnetic fields are not the relevant ionizing-radiation sources. Staff dose is reduced through beam limitation, low-dose modes, distance, protective barriers, and appropriate positioning around the table. This is clinically important.

71. C — Pre-exposure verification catches positioning, centering, marker, and technique problems before radiation is delivered. Delayed evaluation prevents immediate correction, identical factors ignore patient attenuation, and accepting motion may make the image nondiagnostic. A consistent pause, clear instructions, immobilization when appropriate, and careful review of the order help prevent unnecessary repeats. This is clinically important.

72. A — The cumulative timer provides an audible reminder of elapsed fluoroscopy time, encouraging the operator to reassess beam-on use and limit unnecessary exposure. It does not diagnose disease, measure receptor resolution, or monitor cardiac rhythm. Dose management also includes pulsed operation, last-image hold, tight collimation, and appropriate source-to-patient geometry. This is clinically important.

73. B — Keeping the receptor close reduces the air gap and allows the system to maintain image brightness with less output than when the receptor is farther away. Bringing the tube close to the skin raises entrance exposure, while unnecessary magnification usually increases dose. Geometry should be optimized without compromising the procedure or patient safety.

74. C — Distance is a powerful exposure-control measure because radiation intensity decreases rapidly as distance from the source increases. Longer fluoroscopy time raises exposure, standing close to the patient increases scatter dose, and removing barriers eliminates protection. Occupational safety combines minimal time, maximal practical distance, and appropriate shielding while maintaining patient care.

75. A — The dosimeter should represent exposure to the worker's trunk and head, so collar or upper-torso placement facing the source is appropriate when no apron is worn. A pocket can shield or misrepresent exposure, while a key ring or receptor does not measure the technologist's dose. Facility policy determines exact placement.

76. D — A single badge worn at the collar outside the apron monitors exposure to the head and neck, which are not protected by the apron. An ankle badge or equipment-mounted badge does not represent occupational dose. Some programs use two badges, but single-badge placement should follow the monitoring policy and badge instructions.

77. C — Collimation restricts the beam to the required anatomy, reducing patient volume irradiated and the production of scatter radiation. Less scatter also improves image contrast. Collimation does not intentionally create motion or magnification, and it does not replace other protective practices. The light field should be accurately aligned with the radiation field.

78. B — Red bone marrow contains actively dividing hematopoietic precursor cells, making it more radiosensitive than mature muscle, peripheral nerves, or mineralized cortical bone. Radiation sensitivity

generally increases with reproductive activity and decreases with cellular differentiation. Protecting marrow-rich regions and avoiding unnecessary repeats are therefore important parts of patient dose optimization. This is clinically important.

79. A — ALARA means optimizing every exposure so radiation dose is as low as reasonably achievable while still obtaining the needed diagnostic information. It does not require avoiding justified examinations or sacrificing image quality. Selecting appropriate technique, collimating closely, preventing repeats, using shielding appropriately, and maintaining equipment are practical applications of the principle.

80. D — The patient becomes the principal source of scattered x-rays during fluoroscopy after the primary beam interacts with tissue. Monitor light, ultrasound, and table magnetic fields are not the relevant ionizing-radiation sources. Staff dose is reduced through beam limitation, low-dose modes, distance, protective barriers, and appropriate positioning around the table. This is clinically important.

81. B — Pre-exposure verification catches positioning, centering, marker, and technique problems before radiation is delivered. Delayed evaluation prevents immediate correction, identical factors ignore patient attenuation, and accepting motion may make the image nondiagnostic. A consistent pause, clear instructions, immobilization when appropriate, and careful review of the order help prevent unnecessary repeats. This is clinically important.

82. D — The cumulative timer provides an audible reminder of elapsed fluoroscopy time, encouraging the operator to reassess beam-on use and limit unnecessary exposure. It does not diagnose disease, measure receptor resolution, or monitor cardiac rhythm. Dose management also includes pulsed operation, last-image hold, tight collimation, and appropriate source-to-patient geometry. This is clinically important.

83. C — Keeping the receptor close reduces the air gap and allows the system to maintain image brightness with less output than when the receptor is farther away. Bringing the tube close to the skin raises entrance exposure, while unnecessary magnification usually increases dose. Geometry should be optimized without compromising the procedure or patient safety.

84. A — Increasing mAs increases the number of x-ray photons produced and therefore increases exposure reaching the detector, assuming other variables remain constant. More signal generally reduces quantum noise. It does not directly change source-to-image distance, and it does not reduce detector exposure. Patient dose also rises, so technique should remain appropriately optimized.

85. D — Increasing kVp raises the energy and penetrating ability of the x-ray beam and also affects photon production. It does not lower average energy, eliminate scatter, or collimate the field automatically. Because kVp influences receptor exposure, subject contrast, and patient dose, changes should be coordinated with mAs and the clinical imaging task.

86. A — Quantum mottle results when too few photons contribute to image formation, producing random statistical variation and a noisy appearance. Excessive signal creates different concerns, including unnecessary dose and possible saturation. Accurate centering and collimation generally

improve image quality. Technique selection should provide adequate detector exposure without encouraging exposure creep. This is clinically important.

87. B — Spatial resolution is the system's ability to distinguish small, closely spaced structures as separate details. It is influenced by detector element size, sampling, focal spot, motion, and geometry. Patient identifiers, contrast volume, and fluoroscopy duration are important operational variables, but they do not define the imaging system's ability to resolve fine detail.

88. C — Increasing object-to-image receptor distance allows the beam to diverge more before reaching the detector, producing greater magnification and usually more blur. Keeping anatomy close to the receptor and increasing source-to-image distance reduce magnification. When separation is unavoidable, careful alignment and a longer source distance can help limit distortion. This is clinically important.

89. B — Automatic exposure control terminates the exposure when the selected detector chamber receives a predetermined amount of radiation. Correct chamber selection, positioning, collimation, and backup time remain essential. The system does not diagnose the patient, center the beam, or remove scatter. Poor positioning can cause premature termination or excessive exposure. This is clinically important.

90. A — A grid preferentially absorbs obliquely traveling scattered photons before they reach the detector, improving image contrast. Grid use usually requires greater exposure and careful centering. It does not stop scatter production, replace positioning accuracy, or eliminate patient dose. Grid ratio, frequency, and alignment influence both cleanup performance and cutoff risk.

91. D — An upside-down focused grid places diverging lead strips opposite the x-ray beam divergence, causing severe peripheral cutoff and reduced exposure across much of the image. Correct focal distance and perpendicular centering promote alignment. Keeping anatomy near the receptor affects magnification but does not create the characteristic reversed-grid cutoff pattern. This is clinically important.

92. C — Window width determines how broad a range of image values is mapped across the available gray scale, thereby controlling displayed contrast. A wider window generally produces more gray shades and lower display contrast. It does not change patient positioning, focal spot dimensions, or contrast-medium volume, and it cannot recover missing exposure data.

93. C — Window level selects the center of the values displayed and therefore shifts overall image brightness for the anatomy of interest. Window width controls the range and contrast. Neither setting changes detector size, examination duration, or respiration. Display processing improves visualization of acquired data but does not replace correct exposure and positioning.

94. A — Increasing mAs increases the number of x-ray photons produced and therefore increases exposure reaching the detector, assuming other variables remain constant. More signal generally reduces quantum noise. It does not directly change source-to-image distance, and it does not reduce detector exposure. Patient dose also rises, so technique should remain appropriately optimized.

95. D — Increasing kVp raises the energy and penetrating ability of the x-ray beam and also affects photon production. It does not lower average energy, eliminate scatter, or collimate the field automatically. Because kVp influences receptor exposure, subject contrast, and patient dose, changes should be coordinated with mAs and the clinical imaging task.

96. B — Quantum mottle results when too few photons contribute to image formation, producing random statistical variation and a noisy appearance. Excessive signal creates different concerns, including unnecessary dose and possible saturation. Accurate centering and collimation generally improve image quality. Technique selection should provide adequate detector exposure without encouraging exposure creep. This is clinically important.

97. D — Spatial resolution is the system's ability to distinguish small, closely spaced structures as separate details. It is influenced by detector element size, sampling, focal spot, motion, and geometry. Patient identifiers, contrast volume, and fluoroscopy duration are important operational variables, but they do not define the imaging system's ability to resolve fine detail.

98. A — Increasing object-to-image receptor distance allows the beam to diverge more before reaching the detector, producing greater magnification and usually more blur. Keeping anatomy close to the receptor and increasing source-to-image distance reduce magnification. When separation is unavoidable, careful alignment and a longer source distance can help limit distortion. This is clinically important.

99. B — Automatic exposure control terminates the exposure when the selected detector chamber receives a predetermined amount of radiation. Correct chamber selection, positioning, collimation, and backup time remain essential. The system does not diagnose the patient, center the beam, or remove scatter. Poor positioning can cause premature termination or excessive exposure. This is clinically important.

100. C — A grid preferentially absorbs obliquely traveling scattered photons before they reach the detector, improving image contrast. Grid use usually requires greater exposure and careful centering. It does not stop scatter production, replace positioning accuracy, or eliminate patient dose. Grid ratio, frequency, and alignment influence both cleanup performance and cutoff risk.

101. D — An upside-down focused grid places diverging lead strips opposite the x-ray beam divergence, causing severe peripheral cutoff and reduced exposure across much of the image. Correct focal distance and perpendicular centering promote alignment. Keeping anatomy near the receptor affects magnification but does not create the characteristic reversed-grid cutoff pattern. This is clinically important.

102. B — Window width determines how broad a range of image values is mapped across the available gray scale, thereby controlling displayed contrast. A wider window generally produces more gray shades and lower display contrast. It does not change patient positioning, focal spot dimensions, or contrast-medium volume, and it cannot recover missing exposure data.

103. A — Window level selects the center of the values displayed and therefore shifts overall image brightness for the anatomy of interest. Window width controls the range and contrast. Neither setting

changes detector size, examination duration, or respiration. Display processing improves visualization of acquired data but does not replace correct exposure and positioning.

104. C — Increasing mAs increases the number of x-ray photons produced and therefore increases exposure reaching the detector, assuming other variables remain constant. More signal generally reduces quantum noise. It does not directly change source-to-image distance, and it does not reduce detector exposure. Patient dose also rises, so technique should remain appropriately optimized.

105. C — Increasing kVp raises the energy and penetrating ability of the x-ray beam and also affects photon production. It does not lower average energy, eliminate scatter, or collimate the field automatically. Because kVp influences receptor exposure, subject contrast, and patient dose, changes should be coordinated with mAs and the clinical imaging task.

106. B — Quantum mottle results when too few photons contribute to image formation, producing random statistical variation and a noisy appearance. Excessive signal creates different concerns, including unnecessary dose and possible saturation. Accurate centering and collimation generally improve image quality. Technique selection should provide adequate detector exposure without encouraging exposure creep. This is clinically important.

107. A — Spatial resolution is the system's ability to distinguish small, closely spaced structures as separate details. It is influenced by detector element size, sampling, focal spot, motion, and geometry. Patient identifiers, contrast volume, and fluoroscopy duration are important operational variables, but they do not define the imaging system's ability to resolve fine detail.

108. D — Increasing object-to-image receptor distance allows the beam to diverge more before reaching the detector, producing greater magnification and usually more blur. Keeping anatomy close to the receptor and increasing source-to-image distance reduce magnification. When separation is unavoidable, careful alignment and a longer source distance can help limit distortion. This is clinically important.

109. D — Automatic exposure control terminates the exposure when the selected detector chamber receives a predetermined amount of radiation. Correct chamber selection, positioning, collimation, and backup time remain essential. The system does not diagnose the patient, center the beam, or remove scatter. Poor positioning can cause premature termination or excessive exposure. This is clinically important.

110. B — A grid preferentially absorbs obliquely traveling scattered photons before they reach the detector, improving image contrast. Grid use usually requires greater exposure and careful centering. It does not stop scatter production, replace positioning accuracy, or eliminate patient dose. Grid ratio, frequency, and alignment influence both cleanup performance and cutoff risk.

111. C — An upside-down focused grid places diverging lead strips opposite the x-ray beam divergence, causing severe peripheral cutoff and reduced exposure across much of the image. Correct focal distance and perpendicular centering promote alignment. Keeping anatomy near the receptor affects magnification but does not create the characteristic reversed-grid cutoff pattern. This is clinically important.

112. A — Window width determines how broad a range of image values is mapped across the available gray scale, thereby controlling displayed contrast. A wider window generally produces more gray shades and lower display contrast. It does not change patient positioning, focal spot dimensions, or contrast-medium volume, and it cannot recover missing exposure data.

113. A — Window level selects the center of the values displayed and therefore shifts overall image brightness for the anatomy of interest. Window width controls the range and contrast. Neither setting changes detector size, examination duration, or respiration. Display processing improves visualization of acquired data but does not replace correct exposure and positioning.

114. C — Increasing mAs increases the number of x-ray photons produced and therefore increases exposure reaching the detector, assuming other variables remain constant. More signal generally reduces quantum noise. It does not directly change source-to-image distance, and it does not reduce detector exposure. Patient dose also rises, so technique should remain appropriately optimized.

115. D — Increasing kVp raises the energy and penetrating ability of the x-ray beam and also affects photon production. It does not lower average energy, eliminate scatter, or collimate the field automatically. Because kVp influences receptor exposure, subject contrast, and patient dose, changes should be coordinated with mAs and the clinical imaging task.

116. B — Quantum mottle results when too few photons contribute to image formation, producing random statistical variation and a noisy appearance. Excessive signal creates different concerns, including unnecessary dose and possible saturation. Accurate centering and collimation generally improve image quality. Technique selection should provide adequate detector exposure without encouraging exposure creep. This is clinically important.

117. A — Spatial resolution is the system's ability to distinguish small, closely spaced structures as separate details. It is influenced by detector element size, sampling, focal spot, motion, and geometry. Patient identifiers, contrast volume, and fluoroscopy duration are important operational variables, but they do not define the imaging system's ability to resolve fine detail.

118. D — Increasing object-to-image receptor distance allows the beam to diverge more before reaching the detector, producing greater magnification and usually more blur. Keeping anatomy close to the receptor and increasing source-to-image distance reduce magnification. When separation is unavoidable, careful alignment and a longer source distance can help limit distortion. This is clinically important.

119. B — Automatic exposure control terminates the exposure when the selected detector chamber receives a predetermined amount of radiation. Correct chamber selection, positioning, collimation, and backup time remain essential. The system does not diagnose the patient, center the beam, or remove scatter. Poor positioning can cause premature termination or excessive exposure. This is clinically important.

120. C — A grid preferentially absorbs obliquely traveling scattered photons before they reach the detector, improving image contrast. Grid use usually requires greater exposure and careful centering. It

does not stop scatter production, replace positioning accuracy, or eliminate patient dose. Grid ratio, frequency, and alignment influence both cleanup performance and cutoff risk.

121. A — An upside-down focused grid places diverging lead strips opposite the x-ray beam divergence, causing severe peripheral cutoff and reduced exposure across much of the image. Correct focal distance and perpendicular centering promote alignment. Keeping anatomy near the receptor affects magnification but does not create the characteristic reversed-grid cutoff pattern. This is clinically important.

122. B — Window width determines how broad a range of image values is mapped across the available gray scale, thereby controlling displayed contrast. A wider window generally produces more gray shades and lower display contrast. It does not change patient positioning, focal spot dimensions, or contrast-medium volume, and it cannot recover missing exposure data.

123. D — Window level selects the center of the values displayed and therefore shifts overall image brightness for the anatomy of interest. Window width controls the range and contrast. Neither setting changes detector size, examination duration, or respiration. Display processing improves visualization of acquired data but does not replace correct exposure and positioning.

124. C — Increasing mAs increases the number of x-ray photons produced and therefore increases exposure reaching the detector, assuming other variables remain constant. More signal generally reduces quantum noise. It does not directly change source-to-image distance, and it does not reduce detector exposure. Patient dose also rises, so technique should remain appropriately optimized.

125. C — Increasing kVp raises the energy and penetrating ability of the x-ray beam and also affects photon production. It does not lower average energy, eliminate scatter, or collimate the field automatically. Because kVp influences receptor exposure, subject contrast, and patient dose, changes should be coordinated with mAs and the clinical imaging task.

126. D — Quantum mottle results when too few photons contribute to image formation, producing random statistical variation and a noisy appearance. Excessive signal creates different concerns, including unnecessary dose and possible saturation. Accurate centering and collimation generally improve image quality. Technique selection should provide adequate detector exposure without encouraging exposure creep. This is clinically important.

127. B — Spatial resolution is the system's ability to distinguish small, closely spaced structures as separate details. It is influenced by detector element size, sampling, focal spot, motion, and geometry. Patient identifiers, contrast volume, and fluoroscopy duration are important operational variables, but they do not define the imaging system's ability to resolve fine detail.

128. A — Increasing object-to-image receptor distance allows the beam to diverge more before reaching the detector, producing greater magnification and usually more blur. Keeping anatomy close to the receptor and increasing source-to-image distance reduce magnification. When separation is unavoidable, careful alignment and a longer source distance can help limit distortion. This is clinically important.

129. A — Automatic exposure control terminates the exposure when the selected detector chamber receives a predetermined amount of radiation. Correct chamber selection, positioning, collimation, and backup time remain essential. The system does not diagnose the patient, center the beam, or remove scatter. Poor positioning can cause premature termination or excessive exposure. This is clinically important.

130. D — A grid preferentially absorbs obliquely traveling scattered photons before they reach the detector, improving image contrast. Grid use usually requires greater exposure and careful centering. It does not stop scatter production, replace positioning accuracy, or eliminate patient dose. Grid ratio, frequency, and alignment influence both cleanup performance and cutoff risk.

131. C — An upside-down focused grid places diverging lead strips opposite the x-ray beam divergence, causing severe peripheral cutoff and reduced exposure across much of the image. Correct focal distance and perpendicular centering promote alignment. Keeping anatomy near the receptor affects magnification but does not create the characteristic reversed-grid cutoff pattern. This is clinically important.

132. B — Window width determines how broad a range of image values is mapped across the available gray scale, thereby controlling displayed contrast. A wider window generally produces more gray shades and lower display contrast. It does not change patient positioning, focal spot dimensions, or contrast-medium volume, and it cannot recover missing exposure data.

133. D — Window level selects the center of the values displayed and therefore shifts overall image brightness for the anatomy of interest. Window width controls the range and contrast. Neither setting changes detector size, examination duration, or respiration. Display processing improves visualization of acquired data but does not replace correct exposure and positioning.

134. C — Increasing mAs increases the number of x-ray photons produced and therefore increases exposure reaching the detector, assuming other variables remain constant. More signal generally reduces quantum noise. It does not directly change source-to-image distance, and it does not reduce detector exposure. Patient dose also rises, so technique should remain appropriately optimized.

135. B — A PA chest projection centers perpendicular to T7, approximately at the inferior angle of the scapulae, to include the lungs from apices through costophrenic angles. The iliac crest relates to lower abdominal landmarks, the greater trochanter to hip imaging, and the mandibular symphysis to facial structures rather than the thorax.

136. A — In the PA position, the heart lies closer to the detector, reducing magnification compared with an AP projection. The standard long source-to-image distance further limits enlargement. Proper positioning also moves the scapulae away from the lungs. PA imaging therefore provides a more accurate representation of cardiac and mediastinal size. This is clinically important.

137. C — A routine PA chest image is exposed after a full inspiration, commonly the second deep breath, to maximize lung expansion and lower the diaphragm. Expiration is reserved for selected

indications, while breathing during exposure causes motion. A Valsalva maneuver is not the standard instruction and may alter thoracic appearance unnecessarily.

138. D — The AP supine abdomen is centered at the iliac crest level to include the abdominal contents and pubic symphysis on a properly sized receptor. T7 is used for chest centering, the femoral neck for hip projections, and the external auditory meatus for skull positioning. Accurate midline centering reduces rotation and cutoff.

139. B — A left lateral decubitus abdomen with a horizontal beam allows free air to rise along the right side, where it contrasts with the liver rather than the gastric bubble. The patient should remain in position before exposure when possible. A vertical beam or routine supine view may not demonstrate small free-air collections.

140. A — Internal rotation of 15 to 20 degrees places the femoral necks more nearly parallel to the detector and reduces lesser-trochanter prominence. This maneuver is avoided when fracture or dislocation is suspected. External rotation, strong knee flexion, or crossing the ankles distorts the proximal femora and does not produce a standard AP pelvis.

141. B — A tunnel or notch projection directs the beam through the knee joint to demonstrate the intercondylar fossa and related structures. A tangential patella emphasizes the patellofemoral articulation, while ankle and elbow projections image different joints. Exact positioning and angulation vary with the selected method and the patient's condition. This is clinically important.

142. D — Ulnar deviation elongates the scaphoid and reduces superimposition, making a PA wrist scaphoid view useful when fracture is suspected. Some methods also add beam angulation. Forearm, lateral hand, and elbow projections do not isolate the scaphoid. Multiple views remain necessary because an acute fracture may be subtle or occult. This is clinically important.

143. C — A lateral cervical spine centers horizontally at C4, approximately the level of the thyroid cartilage, to include the cervical vertebrae. Depressing the shoulders helps show the lower cervical region. Iliac-crest, T7, and femoral-condyle landmarks belong to abdominal, chest, and knee imaging rather than a routine lateral cervical projection. This is clinically important.

144. A — Lumbar posterior obliques use approximately 45 degrees of body rotation to demonstrate the zygapophyseal joints, with the downside joint shown. A true AP does not open these joints in profile. Knee and chest positions are unrelated. The exact rotation may be adjusted for patient habitus and the anatomy demonstrated on the image.

145. D — Radiolucent support under the dependent waist can make the lumbar spine more nearly horizontal and reduce lateral curvature caused by body shape. Rotating the pelvis creates obliquity, while neck flexion and isolated shoulder elevation do not correct lumbar alignment. Knees are often flexed for stability and to reduce lumbar lordosis.

146. A — The AP open-mouth projection aligns the lower incisors and skull base so the dens and lateral masses of C1 can be seen through the open mouth. If these structures overlap the dens, head adjustment

is needed. Skull, lumbar, and foot projections do not demonstrate the upper cervical relationship required by this view.

147. C — A cephalad angle on the AP axial clavicle projects the clavicle above the ribs and scapula for clearer visualization. The exact angle depends on body habitus and positioning. A caudad direction moves anatomy differently, while knee and ankle centering descriptions are unrelated. Both AP and axial views may be obtained in trauma.

148. B — For a nontrauma frog-leg lateral hip, the affected hip and knee are flexed and the thigh is abducted with external rotation. This demonstrates the femoral head and neck laterally. The maneuver is contraindicated when fracture or dislocation is suspected; a horizontal-beam cross-table lateral is then used to avoid moving the injured limb.

149. A — A horizontal-beam cross-table lateral demonstrates the hip while the injured leg remains extended and undisturbed. The unaffected leg is elevated out of the beam when possible. Frog-leg positioning requires movement that could worsen a fracture. Knee and patellar projections do not evaluate the proximal femur or acetabulum in suspected hip trauma.

150. C — A PA chest projection centers perpendicular to T7, approximately at the inferior angle of the scapulae, to include the lungs from apices through costophrenic angles. The iliac crest relates to lower abdominal landmarks, the greater trochanter to hip imaging, and the mandibular symphysis to facial structures rather than the thorax.

151. B — In the PA position, the heart lies closer to the detector, reducing magnification compared with an AP projection. The standard long source-to-image distance further limits enlargement. Proper positioning also moves the scapulae away from the lungs. PA imaging therefore provides a more accurate representation of cardiac and mediastinal size. This is clinically important.

152. D — A routine PA chest image is exposed after a full inspiration, commonly the second deep breath, to maximize lung expansion and lower the diaphragm. Expiration is reserved for selected indications, while breathing during exposure causes motion. A Valsalva maneuver is not the standard instruction and may alter thoracic appearance unnecessarily.

153. C — The AP supine abdomen is centered at the iliac crest level to include the abdominal contents and pubic symphysis on a properly sized receptor. T7 is used for chest centering, the femoral neck for hip projections, and the external auditory meatus for skull positioning. Accurate midline centering reduces rotation and cutoff.

154. D — A left lateral decubitus abdomen with a horizontal beam allows free air to rise along the right side, where it contrasts with the liver rather than the gastric bubble. The patient should remain in position before exposure when possible. A vertical beam or routine supine view may not demonstrate small free-air collections.

155. B — Internal rotation of 15 to 20 degrees places the femoral necks more nearly parallel to the detector and reduces lesser-trochanter prominence. This maneuver is avoided when fracture or

dislocation is suspected. External rotation, strong knee flexion, or crossing the ankles distorts the proximal femora and does not produce a standard AP pelvis.

156. A — A tunnel or notch projection directs the beam through the knee joint to demonstrate the intercondylar fossa and related structures. A tangential patella emphasizes the patellofemoral articulation, while ankle and elbow projections image different joints. Exact positioning and angulation vary with the selected method and the patient's condition. This is clinically important.

157. C — Ulnar deviation elongates the scaphoid and reduces superimposition, making a PA wrist scaphoid view useful when fracture is suspected. Some methods also add beam angulation. Forearm, lateral hand, and elbow projections do not isolate the scaphoid. Multiple views remain necessary because an acute fracture may be subtle or occult. This is clinically important.

158. D — A lateral cervical spine centers horizontally at C4, approximately the level of the thyroid cartilage, to include the cervical vertebrae. Depressing the shoulders helps show the lower cervical region. Iliac-crest, T7, and femoral-condyle landmarks belong to abdominal, chest, and knee imaging rather than a routine lateral cervical projection. This is clinically important.

159. B — Lumbar posterior obliques use approximately 45 degrees of body rotation to demonstrate the zygapophyseal joints, with the downside joint shown. A true AP does not open these joints in profile. Knee and chest positions are unrelated. The exact rotation may be adjusted for patient habitus and the anatomy demonstrated on the image.

160. B — Radiolucent support under the dependent waist can make the lumbar spine more nearly horizontal and reduce lateral curvature caused by body shape. Rotating the pelvis creates obliquity, while neck flexion and isolated shoulder elevation do not correct lumbar alignment. Knees are often flexed for stability and to reduce lumbar lordosis.

161. A — The AP open-mouth projection aligns the lower incisors and skull base so the dens and lateral masses of C1 can be seen through the open mouth. If these structures overlap the dens, head adjustment is needed. Skull, lumbar, and foot projections do not demonstrate the upper cervical relationship required by this view.

162. D — A cephalad angle on the AP axial clavicle projects the clavicle above the ribs and scapula for clearer visualization. The exact angle depends on body habitus and positioning. A caudad direction moves anatomy differently, while knee and ankle centering descriptions are unrelated. Both AP and axial views may be obtained in trauma.

163. C — For a nontrauma frog-leg lateral hip, the affected hip and knee are flexed and the thigh is abducted with external rotation. This demonstrates the femoral head and neck laterally. The maneuver is contraindicated when fracture or dislocation is suspected; a horizontal-beam cross-table lateral is then used to avoid moving the injured limb.

164. A — A horizontal-beam cross-table lateral demonstrates the hip while the injured leg remains extended and undisturbed. The unaffected leg is elevated out of the beam when possible. Frog-leg

positioning requires movement that could worsen a fracture. Knee and patellar projections do not evaluate the proximal femur or acetabulum in suspected hip trauma.

165. D — A PA chest projection centers perpendicular to T7, approximately at the inferior angle of the scapulae, to include the lungs from apices through costophrenic angles. The iliac crest relates to lower abdominal landmarks, the greater trochanter to hip imaging, and the mandibular symphysis to facial structures rather than the thorax.

166. B — In the PA position, the heart lies closer to the detector, reducing magnification compared with an AP projection. The standard long source-to-image distance further limits enlargement. Proper positioning also moves the scapulae away from the lungs. PA imaging therefore provides a more accurate representation of cardiac and mediastinal size. This is clinically important.

167. A — A routine PA chest image is exposed after a full inspiration, commonly the second deep breath, to maximize lung expansion and lower the diaphragm. Expiration is reserved for selected indications, while breathing during exposure causes motion. A Valsalva maneuver is not the standard instruction and may alter thoracic appearance unnecessarily.

168. C — The AP supine abdomen is centered at the iliac crest level to include the abdominal contents and pubic symphysis on a properly sized receptor. T7 is used for chest centering, the femoral neck for hip projections, and the external auditory meatus for skull positioning. Accurate midline centering reduces rotation and cutoff.

169. A — A left lateral decubitus abdomen with a horizontal beam allows free air to rise along the right side, where it contrasts with the liver rather than the gastric bubble. The patient should remain in position before exposure when possible. A vertical beam or routine supine view may not demonstrate small free-air collections.

170. D — Internal rotation of 15 to 20 degrees places the femoral necks more nearly parallel to the detector and reduces lesser-trochanter prominence. This maneuver is avoided when fracture or dislocation is suspected. External rotation, strong knee flexion, or crossing the ankles distorts the proximal femora and does not produce a standard AP pelvis.

171. C — A tunnel or notch projection directs the beam through the knee joint to demonstrate the intercondylar fossa and related structures. A tangential patella emphasizes the patellofemoral articulation, while ankle and elbow projections image different joints. Exact positioning and angulation vary with the selected method and the patient's condition. This is clinically important.

172. B — Ulnar deviation elongates the scaphoid and reduces superimposition, making a PA wrist scaphoid view useful when fracture is suspected. Some methods also add beam angulation. Forearm, lateral hand, and elbow projections do not isolate the scaphoid. Multiple views remain necessary because an acute fracture may be subtle or occult. This is clinically important.

173. A — A lateral cervical spine centers horizontally at C4, approximately the level of the thyroid cartilage, to include the cervical vertebrae. Depressing the shoulders helps show the lower cervical

region. Iliac-crest, T7, and femoral-condyle landmarks belong to abdominal, chest, and knee imaging rather than a routine lateral cervical projection. This is clinically important.

174. D — Lumbar posterior obliques use approximately 45 degrees of body rotation to demonstrate the zygapophyseal joints, with the downside joint shown. A true AP does not open these joints in profile. Knee and chest positions are unrelated. The exact rotation may be adjusted for patient habitus and the anatomy demonstrated on the image.

175. C — Radiolucent support under the dependent waist can make the lumbar spine more nearly horizontal and reduce lateral curvature caused by body shape. Rotating the pelvis creates obliquity, while neck flexion and isolated shoulder elevation do not correct lumbar alignment. Knees are often flexed for stability and to reduce lumbar lordosis.

176. C — The AP open-mouth projection aligns the lower incisors and skull base so the dens and lateral masses of C1 can be seen through the open mouth. If these structures overlap the dens, head adjustment is needed. Skull, lumbar, and foot projections do not demonstrate the upper cervical relationship required by this view.

177. B — A cephalad angle on the AP axial clavicle projects the clavicle above the ribs and scapula for clearer visualization. The exact angle depends on body habitus and positioning. A caudad direction moves anatomy differently, while knee and ankle centering descriptions are unrelated. Both AP and axial views may be obtained in trauma.

178. A — For a nontrauma frog-leg lateral hip, the affected hip and knee are flexed and the thigh is abducted with external rotation. This demonstrates the femoral head and neck laterally. The maneuver is contraindicated when fracture or dislocation is suspected; a horizontal-beam cross-table lateral is then used to avoid moving the injured limb.

179. D — A horizontal-beam cross-table lateral demonstrates the hip while the injured leg remains extended and undisturbed. The unaffected leg is elevated out of the beam when possible. Frog-leg positioning requires movement that could worsen a fracture. Knee and patellar projections do not evaluate the proximal femur or acetabulum in suspected hip trauma.

180. B — A PA chest projection centers perpendicular to T7, approximately at the inferior angle of the scapulae, to include the lungs from apices through costophrenic angles. The iliac crest relates to lower abdominal landmarks, the greater trochanter to hip imaging, and the mandibular symphysis to facial structures rather than the thorax.

181. A — In the PA position, the heart lies closer to the detector, reducing magnification compared with an AP projection. The standard long source-to-image distance further limits enlargement. Proper positioning also moves the scapulae away from the lungs. PA imaging therefore provides a more accurate representation of cardiac and mediastinal size. This is clinically important.

182. D — A routine PA chest image is exposed after a full inspiration, commonly the second deep breath, to maximize lung expansion and lower the diaphragm. Expiration is reserved for selected

indications, while breathing during exposure causes motion. A Valsalva maneuver is not the standard instruction and may alter thoracic appearance unnecessarily.

183. C — The AP supine abdomen is centered at the iliac crest level to include the abdominal contents and pubic symphysis on a properly sized receptor. T7 is used for chest centering, the femoral neck for hip projections, and the external auditory meatus for skull positioning. Accurate midline centering reduces rotation and cutoff.

184. B — A left lateral decubitus abdomen with a horizontal beam allows free air to rise along the right side, where it contrasts with the liver rather than the gastric bubble. The patient should remain in position before exposure when possible. A vertical beam or routine supine view may not demonstrate small free-air collections.

185. B — Internal rotation of 15 to 20 degrees places the femoral necks more nearly parallel to the detector and reduces lesser-trochanter prominence. This maneuver is avoided when fracture or dislocation is suspected. External rotation, strong knee flexion, or crossing the ankles distorts the proximal femora and does not produce a standard AP pelvis.

186. C — A tunnel or notch projection directs the beam through the knee joint to demonstrate the intercondylar fossa and related structures. A tangential patella emphasizes the patellofemoral articulation, while ankle and elbow projections image different joints. Exact positioning and angulation vary with the selected method and the patient's condition. This is clinically important.

187. A — Ulnar deviation elongates the scaphoid and reduces superimposition, making a PA wrist scaphoid view useful when fracture is suspected. Some methods also add beam angulation. Forearm, lateral hand, and elbow projections do not isolate the scaphoid. Multiple views remain necessary because an acute fracture may be subtle or occult. This is clinically important.

188. D — A lateral cervical spine centers horizontally at C4, approximately the level of the thyroid cartilage, to include the cervical vertebrae. Depressing the shoulders helps show the lower cervical region. Iliac-crest, T7, and femoral-condyle landmarks belong to abdominal, chest, and knee imaging rather than a routine lateral cervical projection. This is clinically important.

189. C — Lumbar posterior obliques use approximately 45 degrees of body rotation to demonstrate the zygapophyseal joints, with the downside joint shown. A true AP does not open these joints in profile. Knee and chest positions are unrelated. The exact rotation may be adjusted for patient habitus and the anatomy demonstrated on the image.

190. A — Radiolucent support under the dependent waist can make the lumbar spine more nearly horizontal and reduce lateral curvature caused by body shape. Rotating the pelvis creates obliquity, while neck flexion and isolated shoulder elevation do not correct lumbar alignment. Knees are often flexed for stability and to reduce lumbar lordosis.

191. D — The AP open-mouth projection aligns the lower incisors and skull base so the dens and lateral masses of C1 can be seen through the open mouth. If these structures overlap the dens, head adjustment

is needed. Skull, lumbar, and foot projections do not demonstrate the upper cervical relationship required by this view.

192. B — A cephalad angle on the AP axial clavicle projects the clavicle above the ribs and scapula for clearer visualization. The exact angle depends on body habitus and positioning. A caudad direction moves anatomy differently, while knee and ankle centering descriptions are unrelated. Both AP and axial views may be obtained in trauma.

193. D — For a nontrauma frog-leg lateral hip, the affected hip and knee are flexed and the thigh is abducted with external rotation. This demonstrates the femoral head and neck laterally. The maneuver is contraindicated when fracture or dislocation is suspected; a horizontal-beam cross-table lateral is then used to avoid moving the injured limb.

194. A — A horizontal-beam cross-table lateral demonstrates the hip while the injured leg remains extended and undisturbed. The unaffected leg is elevated out of the beam when possible. Frog-leg positioning requires movement that could worsen a fracture. Knee and patellar projections do not evaluate the proximal femur or acetabulum in suspected hip trauma.

195. B — A PA chest projection centers perpendicular to T7, approximately at the inferior angle of the scapulae, to include the lungs from apices through costophrenic angles. The iliac crest relates to lower abdominal landmarks, the greater trochanter to hip imaging, and the mandibular symphysis to facial structures rather than the thorax.

196. C — In the PA position, the heart lies closer to the detector, reducing magnification compared with an AP projection. The standard long source-to-image distance further limits enlargement. Proper positioning also moves the scapulae away from the lungs. PA imaging therefore provides a more accurate representation of cardiac and mediastinal size. This is clinically important.

197. A — A routine PA chest image is exposed after a full inspiration, commonly the second deep breath, to maximize lung expansion and lower the diaphragm. Expiration is reserved for selected indications, while breathing during exposure causes motion. A Valsalva maneuver is not the standard instruction and may alter thoracic appearance unnecessarily.

198. B — The AP supine abdomen is centered at the iliac crest level to include the abdominal contents and pubic symphysis on a properly sized receptor. T7 is used for chest centering, the femoral neck for hip projections, and the external auditory meatus for skull positioning. Accurate midline centering reduces rotation and cutoff.

199. D — A left lateral decubitus abdomen with a horizontal beam allows free air to rise along the right side, where it contrasts with the liver rather than the gastric bubble. The patient should remain in position before exposure when possible. A vertical beam or routine supine view may not demonstrate small free-air collections.

200. C — Internal rotation of 15 to 20 degrees places the femoral necks more nearly parallel to the detector and reduces lesser-trochanter prominence. This maneuver is avoided when fracture or

dislocation is suspected. External rotation, strong knee flexion, or crossing the ankles distorts the proximal femora and does not produce a standard AP pelvis.