

# **PRACTICE EXAM 9: ARRT RADIOGRAPHY SIMULATION**

## **(200 QUESTIONS)**

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*This practice exam contains 200 scored-style questions based on the ARRT Radiography content specifications effective March 1, 2027. Allow 230 minutes. Select the single best answer for each question. A scaled score of 75 is the ARRT passing standard; it is not equivalent to 75 percent correct.*

**1. Scenario 001** - During an inpatient portable examination, after removing gloves following contact with body fluids, what should the radiographer do next?

- A. Touch the control console immediately
- B. Put the same gloves back on
- C. Wipe hands on a clean towel
- D. Perform appropriate hand hygiene

**2. Scenario 002** - During a pediatric-capable imaging assignment, a patient becomes pale, diaphoretic, and confused during an examination. What is the priority response?

- A. Stop imaging and assess the patient
- B. Finish the final exposure first
- C. Send the patient out unassisted
- D. Reduce image-processing brightness

**3. Scenario 003** - While assisting in a fluoroscopy room, which technique best protects a sterile field during a bedside procedure?

- A. Reach across the sterile field
- B. Keep sterile items above waist level
- C. Turn away from the sterile field

D. Place sterile supplies below the waist

4. Scenario 004 - While evaluating a newly acquired image, when transferring a weak patient from wheelchair to table, which action is safest?

- A. Pull the patient by both arms
- B. Ask the patient to hold the tube stand
- C. Use a gait belt and obtain assistance
- D. Perform the transfer without locking wheels

5. Scenario 005 - During an inpatient portable examination, which documentation entry is most appropriate after contrast extravasation?

- A. Record findings, actions, and notifications
- B. Delete the injection record
- C. Document only if surgery is required
- D. Describe blame rather than observations

6. Scenario 006 - During a pediatric-capable imaging assignment, before beginning an examination, which action best satisfies correct patient identification?

- A. Confirm only the room assignment
- B. Ask a relative to identify the patient
- C. Use two independent patient identifiers
- D. Match the examination to the schedule

7. Scenario 007 - While assisting in a fluoroscopy room, a competent adult withdraws consent immediately before imaging. What should the radiographer do first?

- A. Complete the ordered images quickly
- B. Stop and clarify the patient's decision

- C. Ask security to prevent departure
- D. Document refusal after performing imaging

**8. Scenario 008** - While evaluating a newly acquired image, which action is most appropriate when a patient has limited English proficiency?

- A. Rely on a young family member
- B. Speak louder using technical terminology
- C. Skip the explanation to save time
- D. Use a qualified medical interpreter

**9. Scenario 009** - During an inpatient portable examination, after removing gloves following contact with body fluids, what should the radiographer do next?

- A. Touch the control console immediately
- B. Put the same gloves back on
- C. Wipe hands on a clean towel
- D. Perform appropriate hand hygiene

**10. Scenario 010** - During a pediatric-capable imaging assignment, a patient becomes pale, diaphoretic, and confused during an examination. What is the priority response?

- A. Finish the final exposure first
- B. Stop imaging and assess the patient
- C. Send the patient out unassisted
- D. Reduce image-processing brightness

**11. Scenario 011** - While assisting in a fluoroscopy room, which technique best protects a sterile field during a bedside procedure?

- A. Keep sterile items above waist level

- B. Reach across the sterile field
- C. Turn away from the sterile field
- D. Place sterile supplies below the waist

**12.** Scenario 012 - A 64 kg patient is prescribed 1.25 mL/kg of contrast. What volume is calculated?

- A. 64 mL
- B. 76.8 mL
- C. 80 mL
- D. 96 mL

**13.** Scenario 013 - During an inpatient portable examination, which documentation entry is most appropriate after contrast extravasation?

- A. Record findings, actions, and notifications
- B. Delete the injection record
- C. Document only if surgery is required
- D. Describe blame rather than observations

**14.** Scenario 014 - During a pediatric-capable imaging assignment, before beginning an examination, which action best satisfies correct patient identification?

- A. Confirm only the room assignment
- B. Use two independent patient identifiers
- C. Ask a relative to identify the patient
- D. Match the examination to the schedule

**15.** Scenario 015 - While assisting in a fluoroscopy room, a competent adult withdraws consent immediately before imaging. What should the radiographer do first?

- A. Complete the ordered images quickly

- B. Ask security to prevent departure
- C. Document refusal after performing imaging
- D. Stop and clarify the patient's decision

**16. Scenario 016 - While evaluating a newly acquired image, which action is most appropriate when a patient has limited English proficiency?**

- A. Rely on a young family member
- B. Speak louder using technical terminology
- C. Use a qualified medical interpreter
- D. Skip the explanation to save time

**17. Scenario 017 - During an inpatient portable examination, after removing gloves following contact with body fluids, what should the radiographer do next?**

- A. Touch the control console immediately
- B. Perform appropriate hand hygiene
- C. Put the same gloves back on
- D. Wipe hands on a clean towel

**18. Scenario 018 - During a pediatric-capable imaging assignment, a patient becomes pale, diaphoretic, and confused during an examination. What is the priority response?**

- A. Stop imaging and assess the patient
- B. Finish the final exposure first
- C. Send the patient out unassisted
- D. Reduce image-processing brightness

**19. Scenario 019 - While assisting in a fluoroscopy room, which technique best protects a sterile field during a bedside procedure?**

- A. Reach across the sterile field
- B. Turn away from the sterile field
- C. Keep sterile items above waist level
- D. Place sterile supplies below the waist

**20.** Scenario 020 - While evaluating a newly acquired image, when transferring a weak patient from wheelchair to table, which action is safest?

- A. Pull the patient by both arms
- B. Ask the patient to hold the tube stand
- C. Perform the transfer without locking wheels
- D. Use a gait belt and obtain assistance

**21.** Scenario 021 - During an inpatient portable examination, which documentation entry is most appropriate after contrast extravasation?

- A. Delete the injection record
- B. Document only if surgery is required
- C. Describe blame rather than observations
- D. Record findings, actions, and notifications

**22.** Scenario 022 - During a pediatric-capable imaging assignment, before beginning an examination, which action best satisfies correct patient identification?

- A. Confirm only the room assignment
- B. Use two independent patient identifiers
- C. Ask a relative to identify the patient
- D. Match the examination to the schedule

**23.** Scenario 023 - While assisting in a fluoroscopy room, a competent adult withdraws consent immediately before imaging. What should the radiographer do first?

- A. Complete the ordered images quickly
- B. Ask security to prevent departure
- C. Stop and clarify the patient's decision
- D. Document refusal after performing imaging

**24. Scenario 024 -** While evaluating a newly acquired image, which action is most appropriate when a patient has limited English proficiency?

- A. Use a qualified medical interpreter
- B. Rely on a young family member
- C. Speak louder using technical terminology
- D. Skip the explanation to save time

**25. Scenario 025 -** During an inpatient portable examination, after removing gloves following contact with body fluids, what should the radiographer do next?

- A. Perform appropriate hand hygiene
- B. Touch the control console immediately
- C. Put the same gloves back on
- D. Wipe hands on a clean towel

**26. Scenario 026 -** During a pediatric-capable imaging assignment, a patient becomes pale, diaphoretic, and confused during an examination. What is the priority response?

- A. Finish the final exposure first
- B. Stop imaging and assess the patient
- C. Send the patient out unassisted
- D. Reduce image-processing brightness

**27. Scenario 027 -** While assisting in a fluoroscopy room, which technique best protects a sterile field during a bedside procedure?

- A. Reach across the sterile field
- B. Turn away from the sterile field
- C. Place sterile supplies below the waist
- D. Keep sterile items above waist level

**28.** Scenario 028 - While evaluating a newly acquired image, when transferring a weak patient from wheelchair to table, which action is safest?

- A. Pull the patient by both arms
- B. Ask the patient to hold the tube stand
- C. Use a gait belt and obtain assistance
- D. Perform the transfer without locking wheels

**29.** Scenario 029 - During an inpatient portable examination, which documentation entry is most appropriate after contrast extravasation?

- A. Delete the injection record
- B. Document only if surgery is required
- C. Describe blame rather than observations
- D. Record findings, actions, and notifications

**30.** Scenario 030 - During a pediatric-capable imaging assignment, before beginning an examination, which action best satisfies correct patient identification?

- A. Use two independent patient identifiers
- B. Confirm only the room assignment
- C. Ask a relative to identify the patient
- D. Match the examination to the schedule

**31.** Scenario 031 - While assisting in a fluoroscopy room, a competent adult withdraws consent immediately before imaging. What should the radiographer do first?

- A. Complete the ordered images quickly
- B. Ask security to prevent departure
- C. Stop and clarify the patient's decision
- D. Document refusal after performing imaging

**32.** Scenario 032 - At a trauma-center imaging suite, which cells are generally most radiosensitive?

- A. Mature neurons with little division
- B. Rapidly dividing, less differentiated cells
- C. Resting skeletal muscle fibers
- D. Highly specialized adipose cells

**33.** Scenario 033 - While covering an evening outpatient shift, a stochastic radiation effect is characterized by which relationship?

- A. Severity always rises above a threshold
- B. Probability increases as dose increases
- C. It occurs only after skin erythema
- D. It has a fixed latency of one day

**34.** Scenario 034 - At a departmental quality-improvement review, which SI unit expresses absorbed radiation dose?

- A. Gray
- B. Sievert
- C. Coulomb per kilogram
- D. Becquerel

**35.** Scenario 035 - An exposure uses 250 mA for 0.06 second. What mAs is produced?

- A. 4.17 mAs

- B. 25 mAs
- C. 150 mAs
- D. 15 mAs

**36.** Scenario 036 - At a trauma-center imaging suite, which interaction is the principal source of occupational scatter during diagnostic radiography?

- A. Pair production in the detector
- B. Photodisintegration in the tube housing
- C. Compton interaction in the patient
- D. Coherent emission from the filament

**37.** Scenario 037 - While covering an evening outpatient shift, increasing kilovoltage primarily changes which beam property?

- A. Focal spot dimensions only
- B. Anode rotation speed only
- C. Detector matrix dimensions only
- D. Photon energy and penetrating ability

**38.** Scenario 038 - At a departmental quality-improvement review, what is the primary purpose of the line-focus principle?

- A. Increase actual focal-track temperature
- B. Eliminate all off-focus radiation
- C. Create a small effective focal spot
- D. Prevent thermionic emission entirely

**39.** Scenario 039 - During a pre-exposure safety pause, which cells are generally most radiosensitive?

- A. Mature neurons with little division

- B. Rapidly dividing, less differentiated cells
- C. Resting skeletal muscle fibers
- D. Highly specialized adipose cells

**40.** Scenario 040 - Radiation intensity is 25 units at 2 meters. What is the intensity at 5 meters?

- A. 4 units
- B. 6.25 units
- C. 10 units
- D. 62.5 units

**41.** Scenario 041 - While covering an evening outpatient shift, which SI unit expresses absorbed radiation dose?

- A. Sievert
- B. Coulomb per kilogram
- C. Becquerel
- D. Gray

**42.** Scenario 042 - At a departmental quality-improvement review, why does increasing distance reduce radiation intensity?

- A. Photons lose all frequency in air
- B. The focal spot stops producing photons
- C. Energy spreads over a larger area
- D. The detector absorbs photons before exposure

**43.** Scenario 043 - During a pre-exposure safety pause, which interaction is the principal source of occupational scatter during diagnostic radiography?

- A. Compton interaction in the patient

- B. Pair production in the detector
- C. Photodisintegration in the tube housing
- D. Coherent emission from the filament

**44.** Scenario 044 - At a trauma-center imaging suite, increasing kilovoltage primarily changes which beam property?

- A. Focal spot dimensions only
- B. Photon energy and penetrating ability
- C. Anode rotation speed only
- D. Detector matrix dimensions only

**45.** Scenario 045 - While covering an evening outpatient shift, what is the primary purpose of the line-focus principle?

- A. Increase actual focal-track temperature
- B. Create a small effective focal spot
- C. Eliminate all off-focus radiation
- D. Prevent thermionic emission entirely

**46.** Scenario 046 - At a departmental quality-improvement review, which cells are generally most radiosensitive?

- A. Mature neurons with little division
- B. Resting skeletal muscle fibers
- C. Highly specialized adipose cells
- D. Rapidly dividing, less differentiated cells

**47.** Scenario 047 - During a pre-exposure safety pause, a stochastic radiation effect is characterized by which relationship?

- A. Probability increases as dose increases
- B. Severity always rises above a threshold
- C. It occurs only after skin erythema
- D. It has a fixed latency of one day

**48.** Scenario 048 - A technique uses 8 mAs at 90 cm SID. What mAs maintains exposure at 135 cm SID?

- A. 12 mAs
- B. 16 mAs
- C. 18 mAs
- D. 27 mAs

**49.** Scenario 049 - While covering an evening outpatient shift, why does increasing distance reduce radiation intensity?

- A. Photons lose all frequency in air
- B. The focal spot stops producing photons
- C. Energy spreads over a larger area
- D. The detector absorbs photons before exposure

**50.** Scenario 050 - At a departmental quality-improvement review, which interaction is the principal source of occupational scatter during diagnostic radiography?

- A. Pair production in the detector
- B. Compton interaction in the patient
- C. Photodisintegration in the tube housing
- D. Coherent emission from the filament

**51.** Scenario 051 - During a pre-exposure safety pause, increasing kilovoltage primarily changes which beam property?

- A. Focal spot dimensions only
- B. Anode rotation speed only
- C. Detector matrix dimensions only
- D. Photon energy and penetrating ability

52. Scenario 052 - At a trauma-center imaging suite, what is the primary purpose of the line-focus principle?

- A. Create a small effective focal spot
- B. Increase actual focal-track temperature
- C. Eliminate all off-focus radiation
- D. Prevent thermionic emission entirely

53. Scenario 053 - While assisting in a fluoroscopy room, which practice best reduces repeat exposures?

- A. Use the same factors for every patient
- B. Verify positioning and technique before exposure
- C. Exclude patients from instructions
- D. Ignore receptor and marker placement

54. Scenario 054 - While evaluating a newly acquired image, why is pulsed fluoroscopy useful for dose management?

- A. It removes the need for collimation
- B. It eliminates all scattered radiation
- C. It produces radiation in timed pulses
- D. It guarantees identical dose for every case

55. Scenario 055 - During an inpatient portable examination, where should a personnel dosimeter normally be worn when using a lead apron?

- A. At the collar outside the apron
- B. At the ankle beneath clothing
- C. On the control booth wall
- D. Inside a storage drawer

**56.** Scenario 056 - During a pediatric-capable imaging assignment, which fluoroscopic feature allows review without continuing exposure?

- A. Magnification mode selection
- B. High-level control activation
- C. Automatic exposure-rate increase
- D. Last-image-hold display

**57.** Scenario 057 - While assisting in a fluoroscopy room, which action most directly reduces patient dose while preserving necessary anatomy?

- A. Open the field beyond the receptor
- B. Collimate closely to the area of interest
- C. Repeat every image for comparison
- D. Increase exposure without evaluation

**58.** Scenario 058 - While evaluating a newly acquired image, during mobile radiography, where should the operator stand when practical?

- A. Directly beside the tube housing
- B. Within the primary beam path
- C. Against the image receptor
- D. As far from the patient as feasible

**59.** Scenario 059 - Scatter measures 12 units at 1 meter. What intensity is expected at 2 meters?

- A. 6 units
- B. 12 units
- C. 3 units
- D. 24 units

**60.** Scenario 060 - During a pediatric-capable imaging assignment, which practice best reduces repeat exposures?

- A. Verify positioning and technique before exposure
- B. Use the same factors for every patient
- C. Exclude patients from instructions
- D. Ignore receptor and marker placement

**61.** Scenario 061 - While assisting in a fluoroscopy room, why is pulsed fluoroscopy useful for dose management?

- A. It removes the need for collimation
- B. It produces radiation in timed pulses
- C. It eliminates all scattered radiation
- D. It guarantees identical dose for every case

**62.** Scenario 062 - While evaluating a newly acquired image, where should a personnel dosimeter normally be worn when using a lead apron?

- A. At the collar outside the apron
- B. At the ankle beneath clothing
- C. On the control booth wall
- D. Inside a storage drawer

**63.** Scenario 063 - During an inpatient portable examination, which fluoroscopic feature allows review without continuing exposure?

- A. Magnification mode selection
- B. High-level control activation
- C. Automatic exposure-rate increase
- D. Last-image-hold display

**64.** Scenario 064 - During a pediatric-capable imaging assignment, which action most directly reduces patient dose while preserving necessary anatomy?

- A. Open the field beyond the receptor
- B. Repeat every image for comparison
- C. Collimate closely to the area of interest
- D. Increase exposure without evaluation

**65.** Scenario 065 - While assisting in a fluoroscopy room, during mobile radiography, where should the operator stand when practical?

- A. As far from the patient as feasible
- B. Directly beside the tube housing
- C. Within the primary beam path
- D. Against the image receptor

**66.** Scenario 066 - Pulse rate decreases from 12 pulses per second to 6 with other factors unchanged. What percentage remains?

- A. 25 percent
- B. 75 percent
- C. 100 percent
- D. 50 percent

**67.** Scenario 067 - During an inpatient portable examination, which practice best reduces repeat exposures?

- A. Use the same factors for every patient
- B. Verify positioning and technique before exposure
- C. Exclude patients from instructions
- D. Ignore receptor and marker placement

**68.** Scenario 068 - During a pediatric-capable imaging assignment, why is pulsed fluoroscopy useful for dose management?

- A. It removes the need for collimation
- B. It eliminates all scattered radiation
- C. It produces radiation in timed pulses
- D. It guarantees identical dose for every case

**69.** Scenario 069 - While assisting in a fluoroscopy room, where should a personnel dosimeter normally be worn when using a lead apron?

- A. At the ankle beneath clothing
- B. On the control booth wall
- C. Inside a storage drawer
- D. At the collar outside the apron

**70.** Scenario 070 - While evaluating a newly acquired image, which fluoroscopic feature allows review without continuing exposure?

- A. Magnification mode selection
- B. High-level control activation
- C. Last-image-hold display
- D. Automatic exposure-rate increase

**71.** Scenario 071 - During an inpatient portable examination, which action most directly reduces patient dose while preserving necessary anatomy?

- A. Collimate closely to the area of interest
- B. Open the field beyond the receptor
- C. Repeat every image for comparison
- D. Increase exposure without evaluation

72. Scenario 072 - During a pediatric-capable imaging assignment, during mobile radiography, where should the operator stand when practical?

- A. Directly beside the tube housing
- B. As far from the patient as feasible
- C. Within the primary beam path
- D. Against the image receptor

73. Scenario 073 - While assisting in a fluoroscopy room, what is the best first response when an exposure indicator suggests substantial overexposure but the image is diagnostic?

- A. Repeat solely to lower the indicator
- B. Delete the image without review
- C. Review technique and correct future exposures
- D. Increase processing brightness only

74. Scenario 074 - While evaluating a newly acquired image, which practice best reduces repeat exposures?

- A. Use the same factors for every patient
- B. Exclude patients from instructions
- C. Ignore receptor and marker placement
- D. Verify positioning and technique before exposure

75. Scenario 075 - Exposure time changes from 0.05 second to 0.02 second at constant mA. What percentage of the original mAs remains?

- A. 20 percent
- B. 40 percent
- C. 50 percent
- D. 250 percent

**76. Scenario 076 -** During a pediatric-capable imaging assignment, where should a personnel dosimeter normally be worn when using a lead apron?

- A. At the collar outside the apron
- B. At the ankle beneath clothing
- C. On the control booth wall
- D. Inside a storage drawer

**77. Scenario 077 -** While assisting in a fluoroscopy room, which fluoroscopic feature allows review without continuing exposure?

- A. Magnification mode selection
- B. Last-image-hold display
- C. High-level control activation
- D. Automatic exposure-rate increase

**78. Scenario 078 -** During a pre-exposure safety pause, which adjustment most directly reduces magnification?

- A. Increase source-to-image receptor distance
- B. Increase object-to-receptor distance
- C. Use a larger focal spot
- D. Increase postprocessing brightness

**79. Scenario 079 -** At a trauma-center imaging suite, what does greater bit depth provide in a digital imaging system?

- A. A physically smaller focal spot
- B. A shorter source-to-image distance
- C. Complete elimination of scatter
- D. More available grayscale values

**80.** Scenario 080 - While covering an evening outpatient shift, which finding most strongly indicates patient rotation on a PA chest image?

- A. Both lungs fully included
- B. Scapulae projected outside the lungs
- C. Unequal medial clavicle-to-spine distances
- D. Ten posterior ribs visible

**81.** Scenario 081 - At a departmental quality-improvement review, what is the primary purpose of a radiographic grid?

- A. Increase the useful field size
- B. Remove the need for collimation
- C. Correct all patient motion
- D. Reduce scatter reaching the detector

**82.** Scenario 082 - During a pre-exposure safety pause, what is the expected effect of patient motion on a radiographic image?

- A. Increased detector bit depth
- B. Elimination of geometric distortion
- C. Reduced recorded spatial resolution
- D. Higher anode heat capacity

**83.** Scenario 083 - A 42 cm field is represented by a 2,100-pixel matrix. What is pixel size in millimeters?

- A. 0.2 mm
- B. 0.02 mm
- C. 1 mm
- D. 2 mm

**84.** Scenario 084 - While covering an evening outpatient shift, what commonly causes quantum mottle in digital radiography?

- A. Excessive monitor luminance alone
- B. Insufficient photons reaching the detector
- C. A matrix containing too many pixels
- D. Use of an anatomical side marker

**85.** Scenario 085 - At a departmental quality-improvement review, which adjustment most directly reduces magnification?

- A. Increase source-to-image receptor distance
- B. Increase object-to-receptor distance
- C. Use a larger focal spot
- D. Increase postprocessing brightness

**86.** Scenario 086 - During a pre-exposure safety pause, what does greater bit depth provide in a digital imaging system?

- A. A physically smaller focal spot
- B. A shorter source-to-image distance
- C. More available grayscale values
- D. Complete elimination of scatter

**87.** Scenario 087 - At a trauma-center imaging suite, which finding most strongly indicates patient rotation on a PA chest image?

- A. Both lungs fully included
- B. Unequal medial clavicle-to-spine distances
- C. Scapulae projected outside the lungs
- D. Ten posterior ribs visible

**88.** Scenario 088 - While covering an evening outpatient shift, what is the primary purpose of a radiographic grid?

- A. Increase the useful field size
- B. Remove the need for collimation
- C. Correct all patient motion
- D. Reduce scatter reaching the detector

**89.** Scenario 089 - At a departmental quality-improvement review, what is the expected effect of patient motion on a radiographic image?

- A. Increased detector bit depth
- B. Elimination of geometric distortion
- C. Reduced recorded spatial resolution
- D. Higher anode heat capacity

**90.** Scenario 090 - During a pre-exposure safety pause, increasing object-to-image receptor distance produces which change?

- A. Less magnification and more sharpness
- B. No geometric effect at all
- C. Higher detector quantum efficiency
- D. Greater magnification and unsharpness

**91.** Scenario 091 - The SID is 120 cm and the source-to-object distance is 80 cm. What is the magnification factor?

- A. 0.67 times
- B. 1.5 times
- C. 1.33 times
- D. 2 times

**92.** Scenario 092 - While covering an evening outpatient shift, which adjustment most directly reduces magnification?

- A. Increase source-to-image receptor distance
- B. Increase object-to-receptor distance
- C. Use a larger focal spot
- D. Increase postprocessing brightness

**93.** Scenario 093 - At a departmental quality-improvement review, what does greater bit depth provide in a digital imaging system?

- A. A physically smaller focal spot
- B. A shorter source-to-image distance
- C. More available grayscale values
- D. Complete elimination of scatter

**94.** Scenario 094 - During a pre-exposure safety pause, which finding most strongly indicates patient rotation on a PA chest image?

- A. Both lungs fully included
- B. Unequal medial clavicle-to-spine distances
- C. Scapulae projected outside the lungs
- D. Ten posterior ribs visible

**95.** Scenario 095 - At a trauma-center imaging suite, what is the primary purpose of a radiographic grid?

- A. Reduce scatter reaching the detector
- B. Increase the useful field size
- C. Remove the need for collimation
- D. Correct all patient motion

**96.** Scenario 096 - While covering an evening outpatient shift, what is the expected effect of patient motion on a radiographic image?

- A. Increased detector bit depth
- B. Elimination of geometric distortion
- C. Higher anode heat capacity
- D. Reduced recorded spatial resolution

**97.** Scenario 097 - At a departmental quality-improvement review, increasing object-to-image receptor distance produces which change?

- A. Less magnification and more sharpness
- B. No geometric effect at all
- C. Higher detector quantum efficiency
- D. Greater magnification and unsharpness

**98.** Scenario 098 - During a pre-exposure safety pause, what commonly causes quantum mottle in digital radiography?

- A. Insufficient photons reaching the detector
- B. Excessive monitor luminance alone
- C. A matrix containing too many pixels
- D. Use of an anatomical side marker

**99.** Scenario 099 - At a trauma-center imaging suite, which adjustment most directly reduces magnification?

- A. Increase object-to-receptor distance
- B. Use a larger focal spot
- C. Increase source-to-image receptor distance
- D. Increase postprocessing brightness

**100.** Scenario 100 - While covering an evening outpatient shift, what does greater bit depth provide in a digital imaging system?

- A. A physically smaller focal spot
- B. More available grayscale values
- C. A shorter source-to-image distance
- D. Complete elimination of scatter

**101.** Scenario 101 - At a departmental quality-improvement review, which finding most strongly indicates patient rotation on a PA chest image?

- A. Both lungs fully included
- B. Scapulae projected outside the lungs
- C. Ten posterior ribs visible
- D. Unequal medial clavicle-to-spine distances

**102.** Scenario 102 - A 25.6 cm field is recorded across 1,024 pixels. What is pixel size in millimeters?

- A. 0.025 mm
- B. 2.5 mm
- C. 0.25 mm
- D. 4 mm

**103.** Scenario 103 - At a trauma-center imaging suite, what is the expected effect of patient motion on a radiographic image?

- A. Reduced recorded spatial resolution
- B. Increased detector bit depth
- C. Elimination of geometric distortion
- D. Higher anode heat capacity

**104.** Scenario 104 - At a trauma-center imaging suite, which standard supports consistent grayscale presentation across diagnostic monitors?

- A. Inverse-square exposure function
- B. Grayscale standard display function
- C. Line-focus geometry function
- D. Anode heel correction function

**105.** Scenario 105 - While covering an evening outpatient shift, what is the role of the automatic exposure control backup timer?

- A. Select the patient's positioning angle
- B. Increase field size automatically
- C. Erase all detector calibration data
- D. Terminate exposure if the primary control fails

**106.** Scenario 106 - At a departmental quality-improvement review, which system enables standardized exchange of medical images and related information?

- A. ALARA
- B. HVL
- C. DICOM
- D. AEC

**107.** Scenario 107 - During a pre-exposure safety pause, a repeating line artifact appears on images from one detector only. What is the best first action?

- A. Repeat every patient examination
- B. Perform detector inspection and quality control
- C. Replace the x-ray tube immediately
- D. Increase window width permanently

**108.** Scenario 108 - At a trauma-center imaging suite, which component converts alternating current to unidirectional current in an x-ray circuit?

- A. Rectifiers
- B. Collimators
- C. Phototimers
- D. Protective aprons

**109.** Scenario 109 - While covering an evening outpatient shift, what is the function of the rotating anode?

- A. Generate electrons by photoemission
- B. Spread heat over a larger focal track
- C. Measure patient entrance exposure
- D. Select the detector matrix

**110.** Scenario 110 - A single-phase exposure uses 75 kVp, 320 mA, and 0.05 second. How many heat units are produced?

- A. 1200 HU
- B. 120 HU
- C. 1600 HU
- D. 12000 HU

**111.** Scenario 111 - During a pre-exposure safety pause, which standard supports consistent grayscale presentation across diagnostic monitors?

- A. Inverse-square exposure function
- B. Line-focus geometry function
- C. Grayscale standard display function
- D. Anode heel correction function

**112.** Scenario 112 - At a trauma-center imaging suite, what is the role of the automatic exposure control backup timer?

- A. Select the patient's positioning angle
- B. Increase field size automatically
- C. Erase all detector calibration data
- D. Terminate exposure if the primary control fails

**113.** Scenario 113 - While covering an evening outpatient shift, which system enables standardized exchange of medical images and related information?

- A. DICOM
- B. ALARA
- C. HVL
- D. AEC

**114.** Scenario 114 - At a departmental quality-improvement review, a repeating line artifact appears on images from one detector only. What is the best first action?

- A. Repeat every patient examination
- B. Replace the x-ray tube immediately
- C. Increase window width permanently
- D. Perform detector inspection and quality control

**115.** Scenario 115 - During a pre-exposure safety pause, which component converts alternating current to unidirectional current in an x-ray circuit?

- A. Collimators
- B. Rectifiers
- C. Phototimers
- D. Protective aprons

**116.** Scenario 116 - At a trauma-center imaging suite, what is the function of the rotating anode?

- A. Generate electrons by photoemission
- B. Measure patient entrance exposure
- C. Spread heat over a larger focal track
- D. Select the detector matrix

**117.** Scenario 117 - While covering an evening outpatient shift, what should occur when a digital detector fails a uniformity test?

- A. Continue until artifacts become severe
- B. Mask every artifact electronically
- C. Remove it from use and report the failure
- D. Increase exposure for all examinations

**118.** Scenario 118 - A detector covers 38.4 cm with 1,920 pixels. What is pixel size in millimeters?

- A. 0.02 mm
- B. 0.2 mm
- C. 2 mm
- D. 5 mm

**119.** Scenario 119 - During a pre-exposure safety pause, what is the role of the automatic exposure control backup timer?

- A. Terminate exposure if the primary control fails

- B. Select the patient's positioning angle
- C. Increase field size automatically
- D. Erase all detector calibration data

**120.** Scenario 120 - At a trauma-center imaging suite, which system enables standardized exchange of medical images and related information?

- A. ALARA
- B. HVL
- C. AEC
- D. DICOM

**121.** Scenario 121 - While covering an evening outpatient shift, a repeating line artifact appears on images from one detector only. What is the best first action?

- A. Perform detector inspection and quality control
- B. Repeat every patient examination
- C. Replace the x-ray tube immediately
- D. Increase window width permanently

**122.** Scenario 122 - At a departmental quality-improvement review, which component converts alternating current to unidirectional current in an x-ray circuit?

- A. Collimators
- B. Phototimers
- C. Protective aprons
- D. Rectifiers

**123.** Scenario 123 - During a pre-exposure safety pause, what is the function of the rotating anode?

- A. Generate electrons by photoemission

- B. Measure patient entrance exposure
- C. Spread heat over a larger focal track
- D. Select the detector matrix

**124.** Scenario 124 - At a trauma-center imaging suite, what should occur when a digital detector fails a uniformity test?

- A. Continue until artifacts become severe
- B. Remove it from use and report the failure
- C. Mask every artifact electronically
- D. Increase exposure for all examinations

**125.** Scenario 125 - While covering an evening outpatient shift, which standard supports consistent grayscale presentation across diagnostic monitors?

- A. Inverse-square exposure function
- B. Line-focus geometry function
- C. Grayscale standard display function
- D. Anode heel correction function

**126.** Scenario 126 - At a departmental quality-improvement review, what is the role of the automatic exposure control backup timer?

- A. Select the patient's positioning angle
- B. Increase field size automatically
- C. Erase all detector calibration data
- D. Terminate exposure if the primary control fails

**127.** Scenario 127 - During a pre-exposure safety pause, which system enables standardized exchange of medical images and related information?

- A. DICOM
- B. ALARA
- C. HVL
- D. AEC

**128.** Scenario 128 - At a trauma-center imaging suite, a repeating line artifact appears on images from one detector only. What is the best first action?

- A. Repeat every patient examination
- B. Perform detector inspection and quality control
- C. Replace the x-ray tube immediately
- D. Increase window width permanently

**129.** Scenario 129 - During an inpatient portable examination, an AP pelvis image shows foreshortened femoral necks. What positioning error is most likely?

- A. Excessive cephalic tube angle
- B. Insufficient internal leg rotation
- C. Overflexion of both knees
- D. Excessive source distance

**130.** Scenario 130 - During a pediatric-capable imaging assignment, which projection is commonly used to demonstrate the sacroiliac joint farthest from the receptor?

- A. Posterior oblique projection
- B. AP axial toes projection
- C. Lateral sternum projection
- D. PA hand projection

**131.** Scenario 131 - While assisting in a fluoroscopy room, for suspected cervical trauma, which image should be obtained before moving the neck?

- A. Forced flexion lateral image
- B. Open-mouth image with rotation
- C. Upright oblique image first
- D. Horizontal-beam lateral cervical image

**132.** Scenario 132 - While evaluating a newly acquired image, which projection best demonstrates the odontoid process through the open mouth?

- A. Lateral lumbar projection
- B. PA axial skull projection
- C. AP open-mouth projection
- D. Tangential patellar projection

**133.** Scenario 133 - During an inpatient portable examination, for a lateral cervical spine, what anatomy must be visible to assess the cervicothoracic junction?

- A. C7 through the top of T1
- B. Only C1 through C3
- C. The entire sacrum and coccyx
- D. Both femoral necks

**134.** Scenario 134 - During a pediatric-capable imaging assignment, which position best demonstrates the zygapophyseal joints of the lumbar spine?

- A. AP axial clavicle position
- B. Posterior oblique position
- C. Lateral knee position
- D. PA wrist position

**135.** Scenario 135 - While assisting in a fluoroscopy room, an AP pelvis image shows foreshortened femoral necks. What positioning error is most likely?

- A. Excessive cephalic tube angle
- B. Overflexion of both knees
- C. Excessive source distance
- D. Insufficient internal leg rotation

**136.** Scenario 136 - While evaluating a newly acquired image, which projection is commonly used to demonstrate the sacroiliac joint farthest from the receptor?

- A. AP axial toes projection
- B. Lateral sternum projection
- C. Posterior oblique projection
- D. PA hand projection

**137.** Scenario 137 - During an inpatient portable examination, for suspected cervical trauma, which image should be obtained before moving the neck?

- A. Forced flexion lateral image
- B. Open-mouth image with rotation
- C. Horizontal-beam lateral cervical image
- D. Upright oblique image first

**138.** Scenario 138 - During a pediatric-capable imaging assignment, which projection best demonstrates the odontoid process through the open mouth?

- A. Lateral lumbar projection
- B. PA axial skull projection
- C. Tangential patellar projection
- D. AP open-mouth projection

**139.** Scenario 139 - While assisting in a fluoroscopy room, for a lateral cervical spine, what anatomy must be visible to assess the cervicothoracic junction?

- A. C7 through the top of T1
- B. Only C1 through C3
- C. The entire sacrum and coccyx
- D. Both femoral necks

**140.** Scenario 140 - While evaluating a newly acquired image, which position best demonstrates the zygapophyseal joints of the lumbar spine?

- A. AP axial clavicle position
- B. Posterior oblique position
- C. Lateral knee position
- D. PA wrist position

**141.** Scenario 141 - During an inpatient portable examination, an AP pelvis image shows foreshortened femoral necks. What positioning error is most likely?

- A. Excessive cephalic tube angle
- B. Insufficient internal leg rotation
- C. Overflexion of both knees
- D. Excessive source distance

**142.** Scenario 142 - During a pediatric-capable imaging assignment, which projection is commonly used to demonstrate the sacroiliac joint farthest from the receptor?

- A. AP axial toes projection
- B. Lateral sternum projection
- C. PA hand projection
- D. Posterior oblique projection

**143.** Scenario 143 - While assisting in a fluoroscopy room, for suspected cervical trauma, which image should be obtained before moving the neck?

- A. Forced flexion lateral image
- B. Open-mouth image with rotation
- C. Horizontal-beam lateral cervical image
- D. Upright oblique image first

**144.** Scenario 144 - While evaluating a newly acquired image, which projection best demonstrates the odontoid process through the open mouth?

- A. AP open-mouth projection
- B. Lateral lumbar projection
- C. PA axial skull projection
- D. Tangential patellar projection

**145.** Scenario 145 - During an inpatient portable examination, for a lateral cervical spine, what anatomy must be visible to assess the cervicothoracic junction?

- A. C7 through the top of T1
- B. Only C1 through C3
- C. The entire sacrum and coccyx
- D. Both femoral necks

**146.** Scenario 146 - During a pediatric-capable imaging assignment, which position best demonstrates the zygapophyseal joints of the lumbar spine?

- A. AP axial clavicle position
- B. Lateral knee position
- C. Posterior oblique position
- D. PA wrist position

**147.** Scenario 147 - While assisting in a fluoroscopy room, an AP pelvis image shows foreshortened femoral necks. What positioning error is most likely?

- A. Excessive cephalic tube angle
- B. Insufficient internal leg rotation
- C. Overflexion of both knees
- D. Excessive source distance

**148.** Scenario 148 - While evaluating a newly acquired image, which projection is commonly used to demonstrate the sacroiliac joint farthest from the receptor?

- A. AP axial toes projection
- B. Lateral sternum projection
- C. PA hand projection
- D. Posterior oblique projection

**149.** Scenario 149 - While assisting in a fluoroscopy room, which breathing instruction is typical for a routine upright abdomen image?

- A. Suspend respiration after expiration
- B. Breathe rapidly during exposure
- C. Suspend after a deep inspiration
- D. Perform a Valsalva maneuver

**150.** Scenario 150 - While evaluating a newly acquired image, a lateral chest image should be positioned with which side against the receptor for routine imaging?

- A. Right side
- B. Left side
- C. Posterior surface
- D. Anterior surface

**151.** Scenario 151 - During an inpatient portable examination, which projection best shows the intercondylar fossa of the knee?

- A. AP axial clavicle projection
- B. Lateral nasal bone projection
- C. Oblique cervical spine projection
- D. PA axial tunnel projection

**152.** Scenario 152 - During a pediatric-capable imaging assignment, why is an upright chest image preferred when evaluating possible pleural air?

- A. Fluid rises above the clavicles
- B. The heart becomes completely undistorted
- C. Air rises toward the lung apex
- D. Respiration is unnecessary

**153.** Scenario 153 - While assisting in a fluoroscopy room, which position best demonstrates free intraperitoneal air when the patient cannot stand?

- A. Right lateral decubitus abdomen
- B. Prone abdomen without a beam
- C. AP axial sacrum
- D. Left lateral decubitus abdomen

**154.** Scenario 154 - While evaluating a newly acquired image, for a PA chest image, why are the shoulders rolled forward?

- A. Raise the diaphragm during inspiration
- B. Move the scapulae away from lung fields
- C. Magnify the heart intentionally
- D. Close both costophrenic angles

**155.** Scenario 155 - During an inpatient portable examination, which breathing instruction is typical for a routine upright abdomen image?

- A. Suspend respiration after expiration
- B. Breathe rapidly during exposure
- C. Suspend after a deep inspiration
- D. Perform a Valsalva maneuver

**156.** Scenario 156 - During a pediatric-capable imaging assignment, a lateral chest image should be positioned with which side against the receptor for routine imaging?

- A. Right side
- B. Posterior surface
- C. Left side
- D. Anterior surface

**157.** Scenario 157 - While assisting in a fluoroscopy room, which projection best shows the intercondylar fossa of the knee?

- A. AP axial clavicle projection
- B. PA axial tunnel projection
- C. Lateral nasal bone projection
- D. Oblique cervical spine projection

**158.** Scenario 158 - While evaluating a newly acquired image, why is an upright chest image preferred when evaluating possible pleural air?

- A. Fluid rises above the clavicles
- B. The heart becomes completely undistorted
- C. Air rises toward the lung apex
- D. Respiration is unnecessary

**159.** Scenario 159 - During an inpatient portable examination, which position best demonstrates free intraperitoneal air when the patient cannot stand?

- A. Right lateral decubitus abdomen
- B. Prone abdomen without a beam
- C. AP axial sacrum
- D. Left lateral decubitus abdomen

**160.** Scenario 160 - During a pediatric-capable imaging assignment, for a PA chest image, why are the shoulders rolled forward?

- A. Move the scapulae away from lung fields
- B. Raise the diaphragm during inspiration
- C. Magnify the heart intentionally
- D. Close both costophrenic angles

**161.** Scenario 161 - While assisting in a fluoroscopy room, which breathing instruction is typical for a routine upright abdomen image?

- A. Suspend respiration after expiration
- B. Breathe rapidly during exposure
- C. Suspend after a deep inspiration
- D. Perform a Valsalva maneuver

**162.** Scenario 162 - While evaluating a newly acquired image, a lateral chest image should be positioned with which side against the receptor for routine imaging?

- A. Right side
- B. Left side
- C. Posterior surface
- D. Anterior surface

**163.** Scenario 163 - During an inpatient portable examination, which projection best shows the intercondylar fossa of the knee?

- A. AP axial clavicle projection
- B. Lateral nasal bone projection
- C. Oblique cervical spine projection
- D. PA axial tunnel projection

**164.** Scenario 164 - During a pediatric-capable imaging assignment, why is an upright chest image preferred when evaluating possible pleural air?

- A. Fluid rises above the clavicles
- B. The heart becomes completely undistorted
- C. Air rises toward the lung apex
- D. Respiration is unnecessary

**165.** Scenario 165 - While assisting in a fluoroscopy room, which position best demonstrates free intraperitoneal air when the patient cannot stand?

- A. Right lateral decubitus abdomen
- B. Left lateral decubitus abdomen
- C. Prone abdomen without a beam
- D. AP axial sacrum

**166.** Scenario 166 - While evaluating a newly acquired image, for a PA chest image, why are the shoulders rolled forward?

- A. Raise the diaphragm during inspiration
- B. Magnify the heart intentionally
- C. Move the scapulae away from lung fields
- D. Close both costophrenic angles

**167.** Scenario 167 - During an inpatient portable examination, which breathing instruction is typical for a routine upright abdomen image?

- A. Breathe rapidly during exposure
- B. Suspend after a deep inspiration
- C. Perform a Valsalva maneuver
- D. Suspend respiration after expiration

**168.** Scenario 168 - During a pediatric-capable imaging assignment, a lateral chest image should be positioned with which side against the receptor for routine imaging?

- A. Left side
- B. Right side
- C. Posterior surface
- D. Anterior surface

**169.** Scenario 169 - While assisting in a fluoroscopy room, which projection best shows the intercondylar fossa of the knee?

- A. PA axial tunnel projection
- B. AP axial clavicle projection
- C. Lateral nasal bone projection
- D. Oblique cervical spine projection

**170.** Scenario 170 - While evaluating a newly acquired image, why is an upright chest image preferred when evaluating possible pleural air?

- A. Fluid rises above the clavicles
- B. The heart becomes completely undistorted
- C. Air rises toward the lung apex
- D. Respiration is unnecessary

**171.** Scenario 171 - During a pediatric-capable imaging assignment, what is the purpose of externally rotating the arm for an AP shoulder?

- A. Superimpose the greater tubercle
- B. Place humeral epicondyles parallel to receptor
- C. Close the glenohumeral joint intentionally
- D. Project the scapula over the ribs

**172.** Scenario 172 - While assisting in a fluoroscopy room, which projection best demonstrates the radial head free of ulnar superimposition?

- A. AP oblique elbow with medial rotation
- B. PA axial wrist with flexion
- C. Lateral shoulder with abduction
- D. AP oblique elbow with lateral rotation

**173.** Scenario 173 - While evaluating a newly acquired image, for an AP knee, where is the central ray generally directed?

- A. At the knee joint with habitus adjustment
- B. At the ankle mortise without angulation
- C. At the femoral neck with rotation
- D. At the iliac crest during inspiration

**174.** Scenario 174 - During an inpatient portable examination, which view is commonly obtained for suspected shoulder dislocation when abduction is limited?

- A. Weight-bearing AP foot projection
- B. Scapular Y lateral projection
- C. Tangential patella projection
- D. PA axial skull projection

**175.** Scenario 175 - During a pediatric-capable imaging assignment, which wrist projection best demonstrates the scaphoid with reduced foreshortening?

- A. PA wrist with radial deviation
- B. Lateral elbow in extension
- C. AP shoulder in external rotation
- D. PA wrist with ulnar deviation

**176.** Scenario 176 - While assisting in a fluoroscopy room, for a lateral elbow, how should the joint be positioned when the patient can cooperate?

- A. Fully extended with palm down
- B. Flexed 30 degrees with palm down
- C. Flexed 90 degrees with thumb up
- D. Internally rotated with thumb down

**177.** Scenario 177 - While evaluating a newly acquired image, which ankle projection best demonstrates the mortise joint uniformly open?

- A. AP ankle with strong external rotation
- B. Lateral ankle with plantar flexion
- C. PA axial calcaneus projection
- D. AP mortise with slight internal rotation

**178.** Scenario 178 - During an inpatient portable examination, what is the purpose of externally rotating the arm for an AP shoulder?

- A. Superimpose the greater tubercle
- B. Close the glenohumeral joint intentionally
- C. Place humeral epicondyles parallel to receptor
- D. Project the scapula over the ribs

**179.** Scenario 179 - During a pediatric-capable imaging assignment, which projection best demonstrates the radial head free of ulnar superimposition?

- A. AP oblique elbow with medial rotation
- B. AP oblique elbow with lateral rotation
- C. PA axial wrist with flexion
- D. Lateral shoulder with abduction

**180.** Scenario 180 - While assisting in a fluoroscopy room, for an AP knee, where is the central ray generally directed?

- A. At the knee joint with habitus adjustment
- B. At the ankle mortise without angulation
- C. At the femoral neck with rotation
- D. At the iliac crest during inspiration

**181.** Scenario 181 - While evaluating a newly acquired image, which view is commonly obtained for suspected shoulder dislocation when abduction is limited?

- A. Weight-bearing AP foot projection
- B. Tangential patella projection
- C. Scapular Y lateral projection
- D. PA axial skull projection

**182.** Scenario 182 - During an inpatient portable examination, which wrist projection best demonstrates the scaphoid with reduced foreshortening?

- A. PA wrist with radial deviation
- B. Lateral elbow in extension
- C. AP shoulder in external rotation
- D. PA wrist with ulnar deviation

**183.** Scenario 183 - During a pediatric-capable imaging assignment, for a lateral elbow, how should the joint be positioned when the patient can cooperate?

- A. Fully extended with palm down
- B. Flexed 90 degrees with thumb up
- C. Flexed 30 degrees with palm down
- D. Internally rotated with thumb down

**184.** Scenario 184 - While assisting in a fluoroscopy room, which ankle projection best demonstrates the mortise joint uniformly open?

- A. AP mortise with slight internal rotation
- B. AP ankle with strong external rotation
- C. Lateral ankle with plantar flexion
- D. PA axial calcaneus projection

**185.** Scenario 185 - While evaluating a newly acquired image, what is the purpose of externally rotating the arm for an AP shoulder?

- A. Superimpose the greater tubercle
- B. Place humeral epicondyles parallel to receptor
- C. Close the glenohumeral joint intentionally
- D. Project the scapula over the ribs

**186.** Scenario 186 - During an inpatient portable examination, which projection best demonstrates the radial head free of ulnar superimposition?

- A. AP oblique elbow with medial rotation
- B. PA axial wrist with flexion
- C. Lateral shoulder with abduction
- D. AP oblique elbow with lateral rotation

**187.** Scenario 187 - During a pediatric-capable imaging assignment, for an AP knee, where is the central ray generally directed?

- A. At the ankle mortise without angulation
- B. At the femoral neck with rotation
- C. At the knee joint with habitus adjustment
- D. At the iliac crest during inspiration

**188.** Scenario 188 - While assisting in a fluoroscopy room, which view is commonly obtained for suspected shoulder dislocation when abduction is limited?

- A. Scapular Y lateral projection
- B. Weight-bearing AP foot projection
- C. Tangential patella projection
- D. PA axial skull projection

**189.** Scenario 189 - While evaluating a newly acquired image, which wrist projection best demonstrates the scaphoid with reduced foreshortening?

- A. PA wrist with radial deviation
- B. Lateral elbow in extension
- C. AP shoulder in external rotation
- D. PA wrist with ulnar deviation

**190.** Scenario 190 - During an inpatient portable examination, for a lateral elbow, how should the joint be positioned when the patient can cooperate?

- A. Fully extended with palm down
- B. Flexed 90 degrees with thumb up
- C. Flexed 30 degrees with palm down
- D. Internally rotated with thumb down

**191.** Scenario 191 - During a pediatric-capable imaging assignment, which ankle projection best demonstrates the mortise joint uniformly open?

- A. AP ankle with strong external rotation
- B. Lateral ankle with plantar flexion
- C. AP mortise with slight internal rotation
- D. PA axial calcaneus projection

**192.** Scenario 192 - While assisting in a fluoroscopy room, what is the purpose of externally rotating the arm for an AP shoulder?

- A. Place humeral epicondyles parallel to receptor
- B. Superimpose the greater tubercle
- C. Close the glenohumeral joint intentionally
- D. Project the scapula over the ribs

**193.** Scenario 193 - While evaluating a newly acquired image, which projection best demonstrates the radial head free of ulnar superimposition?

- A. AP oblique elbow with medial rotation
- B. AP oblique elbow with lateral rotation
- C. PA axial wrist with flexion
- D. Lateral shoulder with abduction

**194.** Scenario 194 - During an inpatient portable examination, for an AP knee, where is the central ray generally directed?

- A. At the ankle mortise without angulation
- B. At the femoral neck with rotation
- C. At the knee joint with habitus adjustment
- D. At the iliac crest during inspiration

**195.** Scenario 195 - During a pediatric-capable imaging assignment, which view is commonly obtained for suspected shoulder dislocation when abduction is limited?

- A. Scapular Y lateral projection
- B. Weight-bearing AP foot projection
- C. Tangential patella projection
- D. PA axial skull projection

**196.** Scenario 196 - While assisting in a fluoroscopy room, which wrist projection best demonstrates the scaphoid with reduced foreshortening?

- A. PA wrist with radial deviation
- B. Lateral elbow in extension
- C. AP shoulder in external rotation
- D. PA wrist with ulnar deviation

**197.** Scenario 197 - While evaluating a newly acquired image, for a lateral elbow, how should the joint be positioned when the patient can cooperate?

- A. Fully extended with palm down
- B. Flexed 30 degrees with palm down
- C. Flexed 90 degrees with thumb up
- D. Internally rotated with thumb down

**198.** Scenario 198 - During an inpatient portable examination, which ankle projection best demonstrates the mortise joint uniformly open?

- A. AP mortise with slight internal rotation
- B. AP ankle with strong external rotation
- C. Lateral ankle with plantar flexion
- D. PA axial calcaneus projection

**199.** Scenario 199 - During a pediatric-capable imaging assignment, what is the purpose of externally rotating the arm for an AP shoulder?

- A. Superimpose the greater tubercle
- B. Close the glenohumeral joint intentionally
- C. Project the scapula over the ribs
- D. Place humeral epicondyles parallel to receptor

**200.** Scenario 200 - While assisting in a fluoroscopy room, which projection best demonstrates the radial head free of ulnar superimposition?

- A. AP oblique elbow with medial rotation
- B. AP oblique elbow with lateral rotation
- C. PA axial wrist with flexion
- D. Lateral shoulder with abduction

## Practice Exam 9: Answer Key and Explanations

**1. D** — Gloves do not replace hand hygiene because contamination may occur during removal or through unnoticed glove defects. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**2. A** — Acute changes require stopping the procedure, assessing airway, breathing, circulation, vital signs, and activating emergency support as indicated. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**3. B** — Sterile items remain in view and above waist level; reaching across, turning away, or lowering them risks contamination. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**4. C** — A gait belt, locked equipment, clear instructions, and sufficient assistance reduce falls and injury to both patient and staff. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer

should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**5. A** — Objective documentation should include the site, symptoms, estimated amount, interventions, instructions, and required notifications without blame or speculation. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**6. C** — Two independent identifiers reduce wrong-patient errors and must be matched with the order before exposure. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**7. B** — A competent patient may withdraw consent. The radiographer should stop, clarify concerns, notify the responsible provider, and document appropriately. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**8. D** — A qualified interpreter supports accurate informed communication, confidentiality, and patient autonomy; untrained relatives can introduce omissions or bias. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**9. D** — Gloves do not replace hand hygiene because contamination may occur during removal or through unnoticed glove defects. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**10. B** — Acute changes require stopping the procedure, assessing airway, breathing, circulation, vital signs, and activating emergency support as indicated. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**11. A** — Sterile items remain in view and above waist level; reaching across, turning away, or lowering them risks contamination. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**12. C** — Multiplying 64 kilograms by 1.25 milliliters per kilogram gives 80 mL. The kilogram units cancel, leaving milliliters. The distractors represent using body weight alone, multiplying by 1.2, or adding instead of applying the prescribed factor. Protocol limits, renal assessment, and authorization must still be confirmed before administration. Applying this calculation principle helps distinguish the best response from distractors that overlook

**13. A** — Objective documentation should include the site, symptoms, estimated amount, interventions, instructions, and required notifications without blame or speculation. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**14. B** — Two independent identifiers reduce wrong-patient errors and must be matched with the order before exposure. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**15. D** — A competent patient may withdraw consent. The radiographer should stop, clarify concerns, notify the responsible provider, and document appropriately. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**16. C** — A qualified interpreter supports accurate informed communication, confidentiality, and patient autonomy; untrained relatives can introduce omissions or bias. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**17. B** — Gloves do not replace hand hygiene because contamination may occur during removal or through unnoticed glove defects. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**18. A** — Acute changes require stopping the procedure, assessing airway, breathing, circulation, vital signs, and activating emergency support as indicated. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**19. C** — Sterile items remain in view and above waist level; reaching across, turning away, or lowering them risks contamination. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer

should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**20. D** — A gait belt, locked equipment, clear instructions, and sufficient assistance reduce falls and injury to both patient and staff. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**21. D** — Objective documentation should include the site, symptoms, estimated amount, interventions, instructions, and required notifications without blame or speculation. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**22. B** — Two independent identifiers reduce wrong-patient errors and must be matched with the order before exposure. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**23. C** — A competent patient may withdraw consent. The radiographer should stop, clarify concerns, notify the responsible provider, and document appropriately. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**24. A** — A qualified interpreter supports accurate informed communication, confidentiality, and patient autonomy; untrained relatives can introduce omissions or bias. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**25. A** — Gloves do not replace hand hygiene because contamination may occur during removal or through unnoticed glove defects. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**26. B** — Acute changes require stopping the procedure, assessing airway, breathing, circulation, vital signs, and activating emergency support as indicated. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**27. D** — Sterile items remain in view and above waist level; reaching across, turning away, or lowering them risks contamination. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**28. C** — A gait belt, locked equipment, clear instructions, and sufficient assistance reduce falls and injury to both patient and staff. Applying this patient care principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

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**32. B** — Radiosensitivity generally increases with mitotic activity and decreases with cellular differentiation, explaining the vulnerability of marrow and germinal tissues. Applying this radiation physics and radiobiology principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or

**33. B** — For stochastic effects, increasing dose raises the probability of occurrence, while severity is not considered dose dependent and no threshold is assumed. Applying this radiation physics and radiobiology principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid

**34. A** — The gray measures energy absorbed per unit mass. The sievert reflects biological weighting, while becquerel describes activity. Applying this radiation physics and radiobiology principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality

consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**35. D** — Tube current multiplied by exposure time gives 15 mAs. Dividing the values or misplacing the decimal produces the distractors. The mAs value relates to total electron flow and strongly affects photon quantity. A correct calculation supports consistent detector exposure and reduces the likelihood of avoidable underexposure, overexposure, or repetition. Applying this calculation principle helps distinguish the best response from distractors

**36. C** — Compton interactions redirect photons and produce much of the scatter reaching personnel; their likelihood relates mainly to electron density. Applying this radiation physics and radiobiology principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or

**37. D** — Higher kilovoltage increases photon energy and beam penetrability while also influencing quantity, subject contrast, and scatter production. Applying this radiation physics and radiobiology principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**38. C** — Angling the target permits a larger actual focal area for heat loading while projecting a smaller effective focal spot for detail. Applying this radiation physics and radiobiology principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary

**39. B** — Radiosensitivity generally increases with mitotic activity and decreases with cellular differentiation, explaining the vulnerability of marrow and germinal tissues. Applying this radiation physics and radiobiology principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or

**40. A** — The inverse-square relationship uses the square of the original-to-new distance ratio. Twenty-five multiplied by two-fifths squared equals 4 units. The other choices use an unsquared ratio, an incorrect fraction, or multiplication. This calculation demonstrates why increasing distance can sharply reduce occupational exposure around a patient who is producing scatter. Applying this calculation principle helps distinguish the best response from distractors

**41. D** — The gray measures energy absorbed per unit mass. The sievert reflects biological weighting, while becquerel describes activity. Applying this radiation physics and radiobiology principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**42. C** — Divergent radiation spreads across an area proportional to distance squared, producing the inverse-square relationship for a point source. Applying this radiation physics and radiobiology principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat

**43. A** — Compton interactions redirect photons and produce much of the scatter reaching personnel; their likelihood relates mainly to electron density. Applying this radiation physics and radiobiology principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or

**44. B** — Higher kilovoltage increases photon energy and beam penetrability while also influencing quantity, subject contrast, and scatter production. Applying this radiation physics and radiobiology principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**45. B** — Angling the target permits a larger actual focal area for heat loading while projecting a smaller effective focal spot for detail. Applying this radiation physics and radiobiology principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary

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**47. A** — For stochastic effects, increasing dose raises the probability of occurrence, while severity is not considered dose dependent and no threshold is assumed. Applying this radiation physics and radiobiology principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid

**48. C** — The distance-maintenance formula multiplies 8 mAs by the squared ratio of 135 to 90. Because the ratio is 1.5, the result is 18 mAs. The distractors omit the square or use incorrect arithmetic. Compensation preserves detector exposure when distance changes, but the clinical technique must remain within equipment and dose constraints.

**49. C** — Divergent radiation spreads across an area proportional to distance squared, producing the inverse-square relationship for a point source. Applying this radiation physics and radiobiology principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-

quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat

**50. B** — Compton interactions redirect photons and produce much of the scatter reaching personnel; their likelihood relates mainly to electron density. Applying this radiation physics and radiobiology principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or

**51. D** — Higher kilovoltage increases photon energy and beam penetrability while also influencing quantity, subject contrast, and scatter production. Applying this radiation physics and radiobiology principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**52. A** — Angling the target permits a larger actual focal area for heat loading while projecting a smaller effective focal spot for detail. Applying this radiation physics and radiobiology principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary

**53. B** — Pre-exposure verification of patient, anatomy, centering, collimation, receptor, marker, and technique prevents avoidable errors and repeats. Applying this radiation protection principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**54. C** — Pulsed operation reduces beam-on time compared with continuous fluoroscopy when pulse rate and other factors are appropriately selected. Applying this radiation protection principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**55. A** — A collar-level dosimeter outside the apron monitors exposure to the head and neck and provides a consistent occupational record. Applying this radiation protection principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**56. D** — Last-image hold displays the most recent fluoroscopic image without additional irradiation, supporting review and positioning decisions. Applying this radiation protection principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**57. B** — Accurate collimation reduces irradiated tissue and scatter, improving image quality while supporting dose optimization. Applying this radiation protection principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**58. D** — Distance sharply reduces scatter exposure; the operator should maximize distance, avoid the primary beam, and use shielding when available. Applying this radiation protection principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**59. C** — Doubling distance reduces intensity to one fourth under the inverse-square law. Twelve units therefore become 3 units. Six reflects simple halving, 12 reflects no change, and 24 reverses the relationship. Real clinical scatter is not a perfect point source, but distance remains a highly effective occupational protection strategy. Applying this calculation principle helps distinguish the best response from distractors that

**60. A** — Pre-exposure verification of patient, anatomy, centering, collimation, receptor, marker, and technique prevents avoidable errors and repeats. Applying this radiation protection principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**61. B** — Pulsed operation reduces beam-on time compared with continuous fluoroscopy when pulse rate and other factors are appropriately selected. Applying this radiation protection principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**62. A** — A collar-level dosimeter outside the apron monitors exposure to the head and neck and provides a consistent occupational record. Applying this radiation protection principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

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**66. D** — The new pulse rate divided by the original rate is 6 divided by 12, or 0.5. Converting to a percentage gives 50 percent. The distractors represent quartering, an incomplete decrease, or no change. Lower pulse frequency may reduce output, although automatic system adjustments and clinical motion requirements must also be considered.

**67. B** — Pre-exposure verification of patient, anatomy, centering, collimation, receptor, marker, and technique prevents avoidable errors and repeats. Applying this radiation protection principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

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**69. D** — A collar-level dosimeter outside the apron monitors exposure to the head and neck and provides a consistent occupational record. Applying this radiation protection principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

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**73. C** — Digital processing can conceal excessive receptor exposure. A diagnostic image generally should not be repeated merely to change an indicator; technique should be corrected. Applying this radiation protection principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid

**74. D** — Pre-exposure verification of patient, anatomy, centering, collimation, receptor, marker, and technique prevents avoidable errors and repeats. Applying this radiation protection principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**75. B** — At unchanged milliamperage, mAs varies directly with time. Dividing 0.02 by 0.05 gives 0.40, so 40 percent of the original mAs remains. The distractors arise from subtracting, assuming a simple half, or reversing the ratio. Technique compensation may be needed to maintain adequate detector exposure while limiting motion. Applying this calculation principle helps distinguish the best response from distractors that

**76. A** — A collar-level dosimeter outside the apron monitors exposure to the head and neck and provides a consistent occupational record. Applying this radiation protection principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

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**78. A** — Increasing source-to-receptor distance reduces beam divergence across the object and therefore reduces magnification, assuming other geometry remains constant. Applying this image acquisition and evaluation principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat

**79. D** — Bit depth determines the number of possible intensity values available to represent image data and therefore supports contrast resolution. Applying this image acquisition and evaluation principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-

quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or

**80. C** — Symmetry of the medial clavicles relative to the vertebral column is a standard indicator of rotation on a PA chest projection. Applying this image acquisition and evaluation principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary

**81. D** — A grid preferentially absorbs obliquely traveling scatter before it reaches the detector, improving image contrast while requiring appropriate exposure. Applying this image acquisition and evaluation principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or

**82. C** — Motion blurs recorded edges and reduces spatial resolution; immobilization, communication, and shorter exposure time can limit the effect. Applying this image acquisition and evaluation principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat

**83. A** — Convert 42 centimeters to 420 millimeters and divide by 2,100 pixels. The resulting pixel size is 0.2 mm. The distractors reflect decimal or unit-conversion errors. Pixel pitch contributes to sampling capability, but final spatial resolution also depends on detector response, focal spot size, patient motion, geometry, and image processing. Applying this calculation principle helps distinguish the best response from distractors

**84. B** — Quantum mottle reflects inadequate photon statistics and poor signal-to-noise ratio; processing cannot recreate signal that was never captured. Applying this image acquisition and evaluation principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat

**85. A** — Increasing source-to-receptor distance reduces beam divergence across the object and therefore reduces magnification, assuming other geometry remains constant. Applying this image acquisition and evaluation principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat

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**87. B** — Symmetry of the medial clavicles relative to the vertebral column is a standard indicator of rotation on a PA chest projection. Applying this image acquisition and evaluation principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary

**88. D** — A grid preferentially absorbs obliquely traveling scatter before it reaches the detector, improving image contrast while requiring appropriate exposure. Applying this image acquisition and evaluation principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or

**89. C** — Motion blurs recorded edges and reduces spatial resolution; immobilization, communication, and shorter exposure time can limit the effect. Applying this image acquisition and evaluation principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat

**90. D** — Greater object-to-receptor distance increases magnification and geometric blur because the divergent beam projects a larger penumbra. Applying this image acquisition and evaluation principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**91. B** — Magnification factor equals source-to-image distance divided by source-to-object distance. Dividing 120 by 80 gives 1.5. The reciprocal and other ratios produce the distractors. Magnification increases when the object is farther from the receptor and decreases when source distance increases, assuming other geometric relationships remain comparable. Applying this calculation principle helps distinguish the best response from distractors that overlook patient safety,

**92. A** — Increasing source-to-receptor distance reduces beam divergence across the object and therefore reduces magnification, assuming other geometry remains constant. Applying this image acquisition and evaluation principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat

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**94. B** — Symmetry of the medial clavicles relative to the vertebral column is a standard indicator of rotation on a PA chest projection. Applying this image acquisition and evaluation principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality

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**102. C** — Convert the 25.6-centimeter field to 256 millimeters, then divide by 1,024 pixels. The result is 0.25 mm per pixel. The other values reflect misplaced decimals or inverted calculations. Smaller pixel dimensions can improve sampling, although recorded detail remains limited by the entire imaging chain rather than matrix size alone. Applying this calculation principle helps distinguish the best response from distractors

**103. A** — Motion blurs recorded edges and reduces spatial resolution; immobilization, communication, and shorter exposure time can limit the effect. Applying this image acquisition and evaluation principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat

**104. B** — The grayscale standard display function provides a standardized relationship between digital driving levels and displayed luminance. Applying this equipment operation and quality assurance principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**105. D** — The backup timer limits an excessively long exposure if the selected chamber or primary exposure-termination system fails. Applying this equipment operation and quality assurance principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat

**106. C** — DICOM defines standards for formatting, storing, transmitting, and identifying medical images across compatible imaging and information systems. Applying this equipment operation and quality assurance principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat

**107. B** — Limiting the artifact to one detector suggests a receptor-related issue requiring inspection, calibration testing, and documentation before further clinical use. Applying this equipment operation and quality assurance principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary

**108. A** — Rectifiers permit electron flow in the desired direction through the x-ray tube and suppress the reverse half-cycle. Applying this equipment operation and quality assurance principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat

**109. B** — Rotation distributes electron-bombardment heat over a larger track, allowing higher tube loading while protecting the target. Applying this equipment operation and quality assurance principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-

quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**110. A** — For single-phase equipment, heat units equal kVp multiplied by mA and seconds. Seventy-five times 320 times 0.05 equals 1,200 HU. The alternatives result from omitting a factor or shifting a decimal. Heat-unit tracking protects the anode and tube housing by guiding workload and cooling decisions between exposures. Applying this calculation principle helps distinguish the best response from distractors that overlook

**111. C** — The grayscale standard display function provides a standardized relationship between digital driving levels and displayed luminance. Applying this equipment operation and quality assurance principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

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**116. C** — Rotation distributes electron-bombardment heat over a larger track, allowing higher tube loading while protecting the target. Applying this equipment operation and quality assurance principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**117. C** — A failed uniformity test can produce nonuniform response and artifacts; established quality-control procedures require reporting, evaluation, and correction. Applying this equipment operation and quality assurance principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or

**118. B** — Convert 38.4 centimeters to 384 millimeters and divide by 1,920 pixels. This gives a 0.2 mm pixel size. The incorrect choices reflect powers-of-ten or division errors. Matrix and field dimensions define sampling pitch, while detector construction, geometry, focal spot, motion, and processing influence the image detail ultimately displayed. Applying this calculation principle helps distinguish the best response from distractors that

**119. A** — The backup timer limits an excessively long exposure if the selected chamber or primary exposure-termination system fails. Applying this equipment operation and quality assurance principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat

**120. D** — DICOM defines standards for formatting, storing, transmitting, and identifying medical images across compatible imaging and information systems. Applying this equipment operation and quality assurance principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat

**121. A** — Limiting the artifact to one detector suggests a receptor-related issue requiring inspection, calibration testing, and documentation before further clinical use. Applying this equipment operation and quality assurance principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary

**122. D** — Rectifiers permit electron flow in the desired direction through the x-ray tube and suppress the reverse half-cycle. Applying this equipment operation and quality assurance principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat

**123. C** — Rotation distributes electron-bombardment heat over a larger track, allowing higher tube loading while protecting the target. Applying this equipment operation and quality assurance principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**124. B** — A failed uniformity test can produce nonuniform response and artifacts; established quality-control procedures require reporting, evaluation, and correction. Applying this equipment operation and quality assurance principle helps distinguish the best response from distractors that overlook patient

safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or

**125. C** — The grayscale standard display function provides a standardized relationship between digital driving levels and displayed luminance. Applying this equipment operation and quality assurance principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**126. D** — The backup timer limits an excessively long exposure if the selected chamber or primary exposure-termination system fails. Applying this equipment operation and quality assurance principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat

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**129. B** — Unless contraindicated, internal rotation places the femoral necks more parallel to the receptor and reduces foreshortening. Applying this head, spine, and pelvis procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**130. A** — Posterior oblique positioning opens the sacroiliac joint farthest from the receptor by rotating the pelvis appropriately. Applying this head, spine, and pelvis procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**131. D** — A horizontal-beam lateral is obtained without moving the cervical spine and can demonstrate alignment before additional projections are attempted. Applying this head, spine, and pelvis procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure

**132. C** — The AP open-mouth projection aligns the open mouth with C1-C2 so the dens and lateral masses can be evaluated. Applying this head, spine, and pelvis procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure

**133. A** — A diagnostic lateral cervical image should include C1 through C7 and the C7-T1 junction, with shoulders depressed when possible. Applying this head, spine, and pelvis procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure

**134. B** — Lumbar posterior obliques demonstrate the zygapophyseal joints closest to the receptor and the characteristic Scotty-dog appearance. Applying this head, spine, and pelvis procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

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**149. A** — Expiration raises the diaphragm and reduces abdominal motion, helping include the diaphragm and abdominal contents on the image. Applying this thorax and abdomen procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat

**150. B** — A left lateral position places the heart closer to the receptor, reducing cardiac magnification and improving evaluation of thoracic anatomy. Applying this thorax and abdomen procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure

**151. D** — A tunnel projection directs the beam through the flexed knee to demonstrate the intercondylar fossa and adjacent condylar surfaces. Applying this thorax and abdomen procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or

**152. C** — In an upright patient, free pleural air rises and is more conspicuous near the apex, particularly on an erect expiration image when requested. Applying this thorax and abdomen procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and

**153. D** — The left lateral decubitus position allows free air to rise adjacent to the liver, where it is less likely to be confused with gastric gas. Applying this thorax and abdomen procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the

**154. B** — Rolling the shoulders forward rotates the scapulae laterally so they do not obscure the lungs on a properly positioned PA chest. Applying this thorax and abdomen procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality

consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary

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**171. B** — External rotation places the epicondyles parallel to the receptor and demonstrates the greater tubercle in profile laterally. Applying this extremity procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**172. D** — Lateral rotation of the elbow projects the radial head, neck, and tuberosity with reduced superimposition by the ulna. Applying this extremity procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**173. A** — The beam centers to the knee joint, with angulation adjusted for patient habitus to open the joint space appropriately. Applying this extremity procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**174. B** — The scapular Y projection can demonstrate humeral-head alignment with the glenoid without requiring the abduction needed for an axillary view. Applying this extremity procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat

**175. D** — Ulnar deviation moves the scaphoid into a more extended position, reducing foreshortening and improving visualization. Applying this extremity procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**176. C** — Ninety-degree flexion and a true lateral hand position superimpose the humeral epicondyles and demonstrate the elbow joint. Applying this extremity procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**177. D** — Approximately slight internal rotation places the intermalleolar line parallel to the receptor and opens the ankle mortise. Applying this extremity procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**178. C** — External rotation places the epicondyles parallel to the receptor and demonstrates the greater tubercle in profile laterally. Applying this extremity procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

**179. B** — Lateral rotation of the elbow projects the radial head, neck, and tuberosity with reduced superimposition by the ulna. Applying this extremity procedures principle helps distinguish the best response from distractors that overlook patient safety, geometry, or image-quality consequences. The radiographer should connect the underlying mechanism with the clinical context, confirm the result, and avoid unnecessary exposure or repeat imaging.

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