

NBCE
Mock Board Questions
Diagnostic Imaging

1. The most common lumbar spine fracture is a _____.
 - A. burst fracture of L3-L5
 - B. Chance fracture
 - C. transverse process fracture
 - D. vertebral body fracture of L1-L2

2. The “Thurston-Holland” sign is a(an) _____.
 - A. avulsion of the ischial tuberosities
 - B. fragment avulsed by the peroneus brevis tendon
 - C. triangular cortical fragment found in a comminuted fracture
 - D. triangular metaphyseal fragment associated with a Salter Harris type II

3. The most common type of anterior humeral dislocation is a _____.
 - A. intrathoracic
 - B. subclavicular
 - C. subcoracoid
 - D. subglenoid

4. The FBI sign is a radiographic indication of _____.
 - A. hematoma
 - B. lipoma
 - C. lipohearthrosis
 - D. pneumocephalus

5. Demonstration of multiple fractures at varying stages of healing is the key radiographic finding in _____.
 - A. non-accidental injury
 - B. pathological fractures
 - C. stress fractures
 - D. whiplash injury

6. An eight year-old girl is skipping through the park when she trips over a log and lands on an out-stretched hand. She would most likely suffer from a _____ fracture.
 - A. Barton’s
 - B. radial head
 - C. Smith’s fracture
 - D. Supracondylar

7. A man falls from a roof (30 feet) and lands on his feet, he has bilateral calcaneal fractures. What other area would you expect a fracture?
 - A. C4/C5
 - B. T2/T3
 - C. S1/S2
 - D. S3/S4

8. The most unstable fracture that can occur in the cervical spine is _____.
- A. extension teardrop
 - B. flexion teardrop
 - C. Hangman's
 - D. Jefferson's
9. An avulsion fracture of the base of the fifth metatarsal is caused by what muscle?
- A. Anterior tibials
 - B. Peroneus brevis
 - C. Peroneus longus
 - D. Posterior tibials
10. The second phase of fracture healing is _____.
- A. circulatory
 - B. inflammatory
 - C. remodeling
 - D. reparative
11. The most common type of epiphyseal fracture is a Salter-Harris type _____.
- A. I
 - B. II
 - C. III
 - D. IV
12. An impaction fractures of the humeral head associated with anterior humeral head dislocations is known as a _____.
- A. Bankart lesion
 - B. FLAP fracture
 - C. Hill-Sach's deformity
 - D. SLAP lesion
13. An avulsion of the ASIS is caused by the _____ muscle and hip flexion _____ the pain.
- A. rectus femoris, decreases
 - B. rectus femoris, increases
 - C. sartorius, decreases
 - D. sartorius, increases
14. Which radiographic sign would most likely be present in a rib fracture?
- A. corner
 - B. double cortex
 - C. extrapleural
 - D. fat-pad
15. A "double spinous process" sign on an AP lower cervical radiograph is indicative of a(an) _____.
- A. Chance fracture
 - B. Clay Shovler's fracture
 - C. Osteblastoma
 - D. Osteoid Osteoma

16. The most common type of idiopathic scoliosis is _____.
- A. infantile
 - B. juvenile
 - C. adolescent
 - D. pediatric
17. Matter easily penetrated by x-ray is called _____.
- A. radioactive
 - B. radiofrequency
 - C. radiolucent
 - D. radiopaque
18. Muscle, skin, and organs are _____ radiographic density.
- A. air
 - B. bone
 - C. fat
 - D. water
19. The zone of provisional calcification is a portion of the _____ of the bone.
- A. diaphysis
 - B. epiphysis
 - C. metaphysis
 - D. physis
20. Surgical fusion of two or more bones is known as _____.
- A. ankylosis
 - B. arthrodesis
 - C. spondylosis
 - D. synostosis
21. The most common location for cervical ribs is located at _____.
- A. C4
 - B. C5
 - C. C6
 - D. C7
22. Knife clasp syndrome is most painful in _____ motion.
- A. extension
 - B. flexion
 - C. lateral bending
 - D. rotation
23. A “Hangman’s” fracture is an example of a(an) _____ spondylolisthesis.
- A. degenerative
 - B. isthmic
 - C. pathological
 - D. traumatic

24. An L5 with 43% slippage on the sacrum is considered a _____ using Meyerding's classification.
- Grade I
 - Grade II
 - Grade III
 - Grade IV
25. The most common anomaly of the chest wall is _____.
- costochondral calcification
 - intrathoracic rib
 - pectus carinatum
 - pectus excavatum
26. Cells that cause bone resorption are called _____.
- osteoblasts
 - osteocytes
 - osteoclasts
 - osteoid
27. An arcuate foramen is associated with a/an _____.
- butterfly vertebra
 - paracondylar process
 - posterior ponticle
 - omovertebral bone
28. The best view to visualize the right intervertebral foramen of the cervical spine is a/an _____.
- left anterior cervical oblique
 - left posterior cervical oblique
 - right neutral lateral cervical
 - right posterior cervical oblique
29. The most common location for a degenerative spondylolisthesis is at _____.
- L2
 - L3
 - L4
 - L5
30. The best radiographic view to visualize the pars interarticularis on is a/an _____.
- anterior lumbar oblique
 - AP lumbar
 - lateral lumbar
 - PA lumbar
31. Notochordal impression is associated with which of the following radiographic sign?
- Cupid's bow
 - Inverted Napoleon hat
 - Ring epiphysis
 - Risser's sign

32. The most radiolucent radiographic density is _____.
- A. air
 - B. bone
 - C. fat
 - D. water
33. Congenital fusion of two or more bones is known as _____.
- A. ankylosis
 - B. arthrodesis
 - C. pathological
 - D. synostosis
34. Calcification within the annular fibers of the disc is known as a/an _____.
- A. intercallary bone
 - B. limbus bone
 - C. omovertebral bone
 - D. sesmoid bone
35. A break in the pars interarticularis with or without slippage is known as _____.
- A. spondylolisthesis
 - B. spondylolysis
 - C. spondyloptosis
 - D. spondylophytes
36. The normal measurement for Bohler's angle is _____ degrees.
- A. 5-18
 - B. 12-30
 - C. 28-40
 - D. 45-70
37. A 62 year-old male complains of a generalized neck stiffness and mild dysphagia. A three view cervical series demonstrates air within the prevertebral soft tissues at C5 and C6 on the neutral lateral projection. An air-fluid level is also present. The most likely diagnosis is a _____ diverticulum.
- A. epiphrenic
 - B. intrathoracic
 - C. Meckel's
 - D. Zenker's
38. Most gallstones are made of _____.
- A. calcium bilirubinate
 - B. calcium oxalate
 - C. cholesterol
 - D. struvite

39. A tumor that contains all three germ layers, including fat, hair and teeth is known as a _____.
- A. dermoid cyst
 - B. fibroma
 - C. hamartoma
 - D. leiomyoma
40. The most common cause for pancreatic calcification is _____.
- A. acute cholecystitis
 - B. alcoholic pancreatitis
 - C. hemorrhage
 - D. hepatitis
41. Multiple air fluid levels on an upright abdomen projection is suggestive of a _____.
- A. gastric obstruction
 - B. large bowel obstruction
 - C. pneumobillia
 - D. small bowel obstruction
42. Free air within the peritoneal cavity is known as _____.
- A. ascites
 - B. paralytic ileus
 - C. pneumobillia
 - D. pneumoperitoneum
43. _____ is the preferred method for evaluation of gallstones.
- A. Computed tomography
 - B. Magnetic resonance imaging
 - C. Plain film radiography
 - D. Ultrasonography
44. Which of the following is associated with San Jauquin Valley fever?
- A. Coccidiomycosis
 - B. Echinococcosis
 - C. Histoplasmosis
 - D. Tuberculosis
45. _____ is the major component of the film emulsion.
- A. Potassium bromide
 - B. Silver bromide
 - C. Silver iodide
 - E. Silver sulfide
46. Of the cell types listed below, which one is the least radiosensitive?
- A. Endothelial cells
 - B. Lymphocytes
 - C. Nerve cells
 - D. Spermatogonia

47. Which of the following will result in an increase in patient dose?
- A. Decreasing the area being x-rayed
 - B. Increasing the grid ratio
 - C. Using a faster film screen combination
 - D. Utilizing added filtration
48. What is the most common cause of tube failure?
- A. Evaporation of the tungsten filament
 - B. Focusing cup melting
 - C. Pitting of the anode
 - D. Rotor failure
49. Which of the following will have no effect of the density of an image?
- A. kVp
 - B. mAs
 - C. Object film distance
 - D. Source image distance
50. Which of the following is responsible for the production of the polyenergetic x-ray beam?
- A. Bremsstrahlung radiation
 - B. Characteristic radiation
 - C. Compton effect
 - D. Photoelectric effect
51. Most electrons that strike the anode target will result in which form of energy?
- A. Bremsstrahlung radiation
 - B. Characteristic radiation
 - C. Static electricity
 - D. Thermal energy
52. _____ is the main factor that controls the detail of a radiographic image.
- A. Focal film distance
 - B. Focal spot size
 - C. Grid ratio
 - D. kVp
53. Compensating filters are placed _____ during a radiographic exposure.
- A. between the cassette and the grid
 - B. between the grid and the film
 - C. between the patient and the grid
 - D. between the tube and the patient
54. Which of the following will increase the amount of scatter produced?
- A. Collimating the field down (making the field smaller)
 - B. Decreasing the kVp
 - C. Increasing the focal film distance
 - D. X-raying a thicker body part

55. Which of the following has a direct linear relationship to the optical density of an image?
- A. Collimation
 - B. Focal film distance
 - C. kVp
 - D. mAs
56. Which of the following metals make up the filament?
- A. Aluminum
 - B. Molybdenum
 - C. Silver
 - D. Tungsten
57. _____ is the process of “boiling off” electrons at the cathode.
- A. Bremsstrahlung radiation
 - B. Characteristic radiation
 - C. Photoelectric effect
 - D. Thermionic emission
58. Radiation that may escape through the protective lead housing of the tube is commonly referred to as _____ radiation.
- A. background
 - B. characteristic
 - C. leakage
 - D. scatter
59. In order to increase the contrast while keeping the optical density of the image the same, which of the following change in technical factors must be made?
- A. Decrease the kVp by 15% and double the mAs
 - B. Decrease the kVp by 15% and the mAs by 50%
 - C. Increase the kVp by 15% and double the mAs
 - D. Increase the kVp by 15% and halve the mAs
60. _____ is the name for the theory of the formation of the latent image.
- A. Coulomb’s theory
 - B. Gurney-Mott hypothesis
 - C. Latent image theory
 - D. Target hypothesis
61. A high kVp will result in which of the following type of contrast?
- A. High contrast with a long grey scale
 - B. High contrast with a short grey scale
 - C. Low contrast with a long grey scale
 - D. Low contrast with a short grey scale
62. Which portion of the x-ray tube does thermionic emission take place?
- A. Actual focal spot
 - B. Anode
 - C. Filament
 - D. Target

63. Which of the following is true regarding an increase in the kVp and the change seen in the x-ray emission spectrum?
- A. It will decrease quality and increase quantity
 - B. It will decrease quality and decrease quantity
 - C. It will increase quality and decrease quantity
 - D. It will increase quality and increase quantity
64. Which of the following individuals is most closely associated with the discovery of x-rays?
- A. BJ Palmer
 - B. Clarence Daily
 - C. Wilhem Roentgen
 - D. William Coolidge
65. Which of the following two factors affect x-ray beam quality?
- A. kVp and filtration
 - B. kVp and source image distance
 - C. mAs and filtration
 - D. mAs and source image distance
66. A radiograph that has insufficient density would be best described as _____.
- A. overdeveloped
 - B. overexposed
 - C. underdeveloped
 - D. underexposed
67. Which process of x-ray production occurs when the projectile electron passes by the nucleus, slows and changes course?
- A. Breaking
 - B. Characteristic
 - C. Compton
 - D. Photoelectric
68. Which of the following is the most common interaction with matter to occur in the diagnostic range?
- A. Classic
 - B. Compton
 - C. Pair production
 - D. Photoelectric
69. What percentage of electrons that hit the anode is converted into useful x-rays?
- A. 1
 - B. 10
 - C. 80
 - D. 99

70. The phenomenon that makes the effective focal spot appear smaller than the actual focal spot because of the target angle is known as the _____.
- A. Edison effect
 - B. line-focus principal
 - C. Roentgen principal
 - D. space charge effect
71. Geometrical unsharpness is also known as _____.
- A. distortion
 - B. magnification
 - C. penumbra
 - D. umbra
72. Which of the following interactions with matter is considered a total absorption interaction?
- A. Classic
 - B. Compton
 - C. Pair production
 - D. Photoelectric
73. What occurs when scatter radiation strikes the film?
- A. Contrast decreases
 - B. Density decreases
 - C. Distortion increases
 - D. Recorded detail increases
74. To decrease magnification of an image, one should use a _____ source image distance and a _____ object image distance.
- A. large, large
 - B. large, small
 - C. small, large
 - D. small, small
75. Which of the following influences the amount of scatter radiation striking the film but not the production of scatter radiation?
- A. Decreasing the kVp
 - B. Increasing the grid ratio
 - C. Reducing the exposure field size
 - D. Reducing tissue thickness
76. Which of the following types of calcification represent malignant cartilage matrix calcification?
- A. Arc and ring calcification
 - B. Ground glass calcification
 - C. Solitary central calcification
 - D. Stippled calcification

77. What is the most common benign tumor of the spine that produces a “corduroy cloth” appearance of the vertebral body?
- A. Chordoma
 - B. Fibrosarcoma
 - C. Hemangioma
 - D. Plasmacytoma
78. The clinical name for the presentation of CPPD is _____.
- A. calcium pipetted droplet disease
 - B. chondrocalcinosis
 - C. gout
 - D. psuedogout
79. A 25 year-old male presents with an insidious onset of low back pain that is difficult to localize and is also felt in the right gluteal region. He reports that it is worse when he gets up in the morning, but gets better after he “gets going”. X-rays of the lumbar spine reveal shiny corner sign at T12, L1 and L2 with some erosion of the anterior discovertebral attachments. The iliac side of the SI joint also appears sclerotic with indistinct joint margins. Which of the following conditions does he most likely have?
- A. Ankyloising spondylitis
 - B. Psoriatic arthritis
 - C. Rhematoid arthritis
 - D. Still’s disease
80. Which of the following is a potential complication for patients with DISH?
- A. Dysarthria
 - B. Dysmetria
 - C. Dysphagia
 - D. Heartburn
81. Which of the following is the most accurate description of the clinical presentation of DJD?
- A. Abrupt onset
 - B. “Bag of bones” felling upon palpation
 - C. Hot swollen joints
 - D. Insidious onset
82. Patients with hypertrophic osteoarthropathy will demonstrate what characteristic clinical finding?
- A. Atrophy of the distal extremities
 - B. Clubbing of the distal fingers
 - C. Pitting of the finger nails
 - D. Soft tissue swelling oozing with calcification

83. A new patient comes into your office and complains of spinal stiffness and a generalized achy feeling in their back. Physical exam demonstrates mild ataxia in their gait. When asked about it, the patient says they do feel clumsier lately. X-rays reveal the classic picture of DISH. Given this patient's presentation, what other condition should be searched for?
- A. Intervertebral osteochondrosi
 - B. Ossification of the posterior longitudinal ligament
 - C. Rheumatoid arthritis
 - D. Spondylosis deformans
84. What is podagra?
- A. CPPD of the big toe
 - B. CPPD of the elbow
 - C. Gout of the big toe
 - D. Gout of the elbow
85. A syndrome of abnormal proliferation of the skin at the distal portions of the extremities and bilateral periosteal responses of the bones of the extremities secondary to some other systemic disease constitutes which of the follow?
- A. Hyperparathyroidism
 - B. Hypertrophic osteoarthropathy
 - C. Scleroderma
 - D. Systemic lupus erythematosus
86. In which projection is the knee flexed more than 90 degrees?
- A. Intercondylar knee
 - B. Lateral knee
 - C. Tangential knee
 - D. Tunnel knee
87. Which of the following is true regarding the wrist series?
- A. In the lateral view, the fingers must be spread apart in a "okay sign".
 - B. In the PA view, the palm is flat against the film.
 - C. The central ray is directed 1 inch above the wrist.
 - D. The standard series fits on one film.
88. What is the correct tube tilt for an AP lower cervical projection?
- A. 5 degrees caudal
 - B. 15 degrees caudal
 - C. 5 degrees cephalic
 - D. 15 degrees cephalic
89. Which of the following laboratory procedures is most beneficial for evaluating Paget's disease?
- A. Acid posphatase
 - B. Akaline phosphatase
 - C. ESR
 - D. Homogentistic acid

90. Which of the following radiographic line/angel is most helpful in evaluating slipped capital femoral epiphysis?
- A. Bohler's angel
 - B. Klien's line
 - C. Kohler's line
 - D. Skinner's line
91. The "fallen fragment" sign is associated with which of the following?
- A. Aneurysmal bone cyst
 - B. Giant cell tumor
 - C. Osteoid osteoma
 - D. Simple bone cyst
92. Terms such as "Bowline of Brailsford" and "Inverted Napoleon hat" sign are most closely associated with _____.
- A. Spondylolisthesis
 - B. Spondylolysis
 - C. Spondylosis
 - D. Sponlyoptosis
93. Which of the following is most closely related with the skull findings of hyperparathyroidism?
- A. Cotton-wool skull
 - B. Osteoporosis circumscripta
 - C. Rain drop skull
 - D. Salt and pepper skull
94. Which of the following conditions is associated with "Coast of California" café au lait spots?
- A. Fibrous dysplasia
 - B. Marfan's
 - C. Neurofibromatosis
 - D. Scleraderma
95. Tuberculous spondylitis is also known as _____ disease?
- A. Panner's
 - B. Pott's
 - C. Preiser's
 - D. Pudding's
96. _____ is the most common benign tumor of the skeleton.
- A. Chondroblastoma
 - B. Osteoblastoma
 - C. Osteochondroma
 - D. Plasmacytoma

97. _____ is the hallmark of hyperparathyroidism.
- A. Acral osteolysis
 - B. Chondrocalcinosis
 - C. Enhancement of the metaphyseal band
 - D. Subperiosteal resorption
98. An “H-shaped” vertebra is most likely seen in _____.
- A. acromegaly
 - B. hemophilia
 - C. sickle cell anemia
 - D. thalassemia
99. Which of the following is not considered a differential diagnosis for an “ivory” vertebra?
- A. Fibrosarcoma
 - B. Hodgkin’s lymphoma
 - C. Osteoblastic metastatic carcinoma
 - D. Paget’s disease
100. The unit used to measure density of tissues on CT scans is known as?
- A. Gantry
 - B. Hounsfield
 - C. Ledley
 - D. Scintillation
101. Which of the following is the best description for a disc protrusion?
- A. Base of the lesion at the origin is broader than disc material beyond the disc space.
 - B. Disc material beyond the disc space is broader than the base.
 - C. Disc material beyond the disc space is no longer continuous with the disc.
 - D. Disc material beyond the disc space is continuous with the disc; however, it has migrated inferiorly or superiorly.
102. Migration of nuclear material outside the fibers of the annulus fibrosus and posterior longitudinal ligament is best described as a _____ disc.
- A. bulged
 - B. contained
 - C. hard
 - D. non-contained
103. A soft-tissue lipoma would appear hyperintense on which MRI weighted image?
- A. Proton-weighted with fat suppression
 - B. STIR
 - C. T1
 - D. T2

104. Which of the following creates a myelographic effect without the use of contrast material?
- A. Computed tomography
 - B. MRI T1 weighted image
 - C. MRI T2 weighted image
 - D. Nuclear scan
105. Which is the most commonly employed radiopharmaceutical agent utilized in skeletal nuclear medicine imaging?
- A. Gallium-67
 - B. Gallium-111
 - C. Indium-111
 - D. Technetium-99
106. Nuclear medicine is best described as _____.
- A. high specificity and high sensitivity
 - B. high specificity and low sensitivity
 - C. low specificity and high sensitivity
 - D. low specificity and low sensitivity
107. Which of the following is the best view to demonstrate an os odontoidum?
- A. AP lower cervical
 - B. AP open mouth
 - C. Neutral lateral cervical
 - D. Right anterior cervical oblique
108. A mid-line lucency at S1 with an elongated L5 spinous process is known as a _____ deformity.
- A. assimilation
 - B. butterfly
 - C. clasp-knife
 - D. Schmorl's node
109. Which of the following views is most beneficial for evaluating the cervicothoracic junction?
- A. Apical lordotic
 - B. Lateral cervical
 - C. Lateral thoracic
 - D. Swimmer's projection
110. Which of the following lines/angles is used to evaluate possible basilar impression?
- A. Bohler's angle
 - B. Macrae's line
 - C. Mikulicz's angle
 - D. Skinner's line

**NBCE
MOCK BOARD
QUESTIONS
DIAGNOSTIC
IMAGING
Answer Key**

- | | | | | | |
|-----|---|-----|----|------|---|
| 1. | D | 43. | D | 93. | D |
| 2. | D | 44. | A | 94. | C |
| 3. | C | 45. | B | 95. | B |
| 4. | C | 46. | C | 96. | C |
| 5. | A | 47. | B | 97. | D |
| 6. | D | 48. | A | 98. | C |
| 7. | C | 49. | C | 99. | A |
| 8. | B | 50. | A | 100. | B |
| 9. | B | 51. | D | 101. | A |
| 10. | D | 52. | B | 102. | D |
| 11. | B | 53. | D | 103. | C |
| 12. | C | 54. | D | 104. | C |
| 13. | C | 55. | D | 105. | D |
| 14. | C | 56. | D | 106. | C |
| 15. | B | 57. | D | 107. | B |
| 16. | C | 58. | C | 108. | C |
| 17. | C | 59. | D | 109. | D |
| 18. | D | 60. | B | 110. | B |
| 19. | D | 61. | C | | |
| 20. | B | 62. | C | | |
| 21. | D | 63. | D | | |
| 22. | A | 64. | C | | |
| 23. | D | 65. | A | | |
| 24. | B | 66. | D | | |
| 25. | D | 67. | A | | |
| 26. | C | 68. | B | | |
| 27. | C | 69. | A | | |
| 28. | B | 70. | B | | |
| 29. | C | 71. | C | | |
| 30. | A | 72. | D | | |
| 31. | A | 73. | A | | |
| 32. | A | 74. | B | | |
| 33. | D | 75. | B | | |
| 34. | A | 76. | A | | |
| 35. | B | 77. | C | | |
| 36. | C | 78. | D | | |
| 37. | D | 79. | A | | |
| 38. | C | 80. | C | | |
| 39. | A | 81. | D | | |
| 40. | B | 82. | B | | |
| 41. | D | 83. | B | | |
| 42. | D | 84. | C | | |
| | | 85. | B | | |
| | | 86. | C | | |
| | | 87. | D | | |
| | | 88. | D | | |
| | | 89. | B. | | |
| | | 90. | B | | |
| | | 91. | D | | |
| | | 92. | D | | |