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## **Test Questions**

### Chapter 2

1. The chest includes very dense bones to very low-density air filled \_\_\_\_\_.
  - A. heart
  - B. lungs
  - C. ribs
  - D. clavicles
2. Placing an air gap between the patient and \_\_\_\_\_ increases the chance that the scattered X-rays will "miss" the X-ray film or imaging plate and therefore not affect image quality.
  - A. the X-ray film
  - B. collimator
  - C. x-ray tube
  - D. none of the above
3. \_\_\_\_\_ is placed between the patient and the x-ray film or imaging plate to reduce the scatter radiation.
  - A. Shielding
  - B. Collimator
  - C. Filter
  - D. Grid
4. The grid is made up of many strips of **x-ray absorbing** \_\_\_\_\_ placed closely together.
  - A. wood
  - B. plastic
  - C. lead
  - D. rubber
5. The X-ray tube is positioned behind the patient hence the X-rays pass from \_\_\_\_\_.
  - A. posterior to anterior (PA)
  - B. anterior to posterior (AP)
  - C. decubitus side
  - D. lateral side
6. If the PA technique is not possible for patients confined to bed or chair, the X-ray film is placed behind them and the X-ray tube in front so that the X-rays pass from \_\_\_\_\_.
  - A. posterior to anterior (PA)
  - B. anterior to posterior (AP)
  - C. decubitus side
  - D. lateral side
7. The heart is an anterior organ in the chest and its size is \_\_\_\_\_ on an AP view due to both the increase in divergence of the incident X-rays.
  - A. minified
  - B. minification
  - C. magnified
  - D. smaller
8. On AP films, the \_\_\_\_\_ cast a broader shadow and typically overlay the apices making interpretation of these areas difficult.
  - A. clavicles
  - B. scapula
  - C. c-spine
  - D. humerus

9. Which of the following chest view better demonstrate mediastinal structures?
- A. PA
  - B. AP
  - C. decubitus
  - D. lateral
10. Which of the following pathology better appreciated on the lateral CXR?
- A. right middle lobe collapse
  - B. lingular collapse
  - C. consolidation
  - D. all of the above
11. \_\_\_\_\_ uses a combination of a light sensitive film placed against an X-ray absorbing screen that converts X-ray photons to visible light (scintillation).
- A. Digital radiography
  - B. Conventional radiography
  - C. Computed radiography
  - D. MRI
12. The response of the film/screen combination to radiation exposure is not \_\_\_\_\_ throughout the range of exposures.
- A. minified
  - B. magnified
  - C. linear
  - D. smaller
13. \_\_\_\_\_ uses either a storage phosphor plate, which is read by a laser after the exposure, or by converting the incident X-ray directly into an electrical signal.
- A. Digital radiography
  - B. Conventional radiography
  - C. Ultrasound
  - D. MRI
14. X-rays are produced when fast moving \_\_\_\_\_ impact on a tungsten target.
- A. electrons
  - B. protons
  - C. neutrons
  - D. atom shells
15. The \_\_\_\_\_ determines the electron energy.
- A. filament
  - B. tube voltage
  - C. mA meter
  - D. focusing cup
16. The \_\_\_\_\_ is defined by the rate per second at which electrons hit the target in the X-ray tube.
- A. kVp
  - B. velocity
  - C. mA
  - D. mass
17. Figure 2.9 (black arrows) demonstrates which of the following anatomy?
- A. heart
  - B. ribs
  - C. kidneys
  - D. costophrenic angles
18. In figure 2.12, **arrow b** is pointed toward which of the following anatomy?
- A. right atrium
  - B. left ventricle
  - C. esophagus

D. ribs

19. Figure 2.17 (black arrows) demonstrates which of the following?

A. oxygen tube

B. NG tube

C. neck collar

D. artifact

Chapter 3

20. In the lungs, the term silhouette sign refers to interfaces (boundaries) between \_\_\_\_\_ structures and aerated lung.

A. bones

B. ribs

C. soft tissue

D. none of the above

21. Which of the following needs to be covered before reading the chest x-ray?

A. patient name and date on x-ray

B. markers and views(PA/AP)

C. is patient erect, semi-erect or supine

D. all of the above

22. The review areas are those parts of the CXR in which an abnormality can easily be overlooked and therefore require particular attention.

A. TRUE

B. FALSE

23. The costophrenic angle in normal chest x-ray should be \_\_\_\_\_.

A. blunting

B. sharp

C. crooked

D. blurry

24. The \_\_\_\_\_ lies under the right hemidiaphragm.

A. stomach

B. liver

C. heart

D. pancreas

25. Which of the following may interpose between the liver and the diaphragm mimicking free gas?

A. The colon

B. kidneys

C. esophagus

D. ribs

26. A well taken CXR will demonstrate the \_\_\_\_\_ projected through the cardiac shadow.

A. liver

B. ribs

C. thoracic spine

D. cervical spine

27. A hiatus hernia or esophageal dilatation will be projected behind the heart and often contains \_\_\_\_\_ in CXR.

A. cholesterol

B. stone

C. gas

D. tumor

28. In figure 3.23 (black arrows), CXR of an infant demonstrates which of the following?

A. left lower lobe collapse

B. kidneys

C. hemothorax

D. Tuberculosis

29. Folds in the skin can trap air creating a soft tissue/air interface and thus a line on the CXR which can mimic the lung edge of a \_\_\_\_\_.

- A. gastritis
- B. pneumothorax
- C. hepatomegaly
- D. fracture

30. A correctly centered CXR will project the spinous processes of the thoracic spine mid way between the medial ends of the \_\_\_\_\_.

- A. clavicles
- B. kidneys
- C. scapula
- D. ribs

31. If there are less than \_\_\_\_ anterior ribs projected above the hemidiaphragms then the film has been taken with a poor inspiratory effort.

- A. 2
- B. 3
- C. 4
- D. 6

32. Which of the following can produce artifacts on an x-ray image?

- A. dirt
- B. dust
- C. hair
- D. all of the above

#### Chapter 4

33. In CT image in figure 4.3, black arrow pointed toward which of the following?

- A. rib
- B. stone
- C. mediastinal fat
- D. tumor

34. In which of the following view, the x-ray beam angled upwards from the front or downwards from the back?

- A. lordotic view
- B. PA view
- C. AP view
- D. Lateral view

35. An obstruction of the left or right main \_\_\_\_\_ can cause collapse of an **entire** lung.

- A. aorta
- B. bronchus
- C. femoral artery
- D. esophagus

36. Consolidation describes the filling of the air spaces of the lung with material other than air like:

- A. water
- B. pus
- C. blood
- D. all of the above

37. The small airways containing air and surrounded by opacified lung become visible by which of the following?

- A. arthrograph
- B. cystogram
- C. air bronchograms
- D. urethrograph

38. The black arrows in CT image in figure 4.9 demonstrate which of the following?
- A. tubular airway
  - B. ribs
  - C. trachea
  - D. clavicles
39. Which of the following increases the density of the lungs?
- A. water
  - B. pus
  - C. blood and fibrosis
  - D. all of the above
40. A mass in lungs is defined as an opacity measuring \_\_\_\_ or more in diameter.
- A. .1 cm
  - B. .2 cm
  - C. .5 cm
  - D. 3 cm
41. The CT image in figure 4.14 represents (white arrow) which of the following?
- A. aorta
  - B. lymphoma
  - C. bronchus
  - D. liver
42. Which of the following are some of the diseases that cause multiple nodules into the lungs?
- A. fungal infection
  - B. lymphoma
  - C. Pulmonary edema
  - D. all of the above
43. Parenchymal bands result from \_\_\_\_\_ of a sub-segmental portion of lung usually found following focal pneumonia, pulmonary embolism or upper abdominal surgery.
- A. gastritis
  - B. atelectasis (collapse)
  - C. hepatomegaly
  - D. pneumothorax
44. Which of the following causes septal lines on CXR?
- A. Left ventricular failure
  - B. Pneumoconioses or Sarcoid
  - C. Lymphangitis carcinomatosa
  - D. all of the above
45. \_\_\_\_\_ represents thickening of the lung interstitium and is difficult to identify with confidence on a CXR.
- A. Pneumothorax
  - B. Reticulation
  - C. Hemothorax
  - D. none of the above
46. The black arrow in figure 4.25 represents which of the following?
- A. rib metastasis
  - B. atelectasis
  - C. trachea
  - D. tubular airway
- Chapter 5
47. \_\_\_\_\_ causes a shift of the heart to the left and an abnormal angle to the ribs adjoining the sternum.
- A. Pneumothorax
  - B. Pectus excavatum

- C. Hemothorax
- D. Atelectasis

48. Pectus excavatum occurs as an isolated phenomenon but is also strongly associated with \_\_\_\_\_.

- A. Left ventricular failure
- B. Pneumoconioses or Sarcoid
- C. Hemothorax
- D. Marfan's syndrome

49. The CT image (black arrow) in figure 5.1 demonstrates which of the following?

- A. depressed sternum
- B. rib metastasis
- C. trachea
- D. tubular airway

50. \_\_\_\_\_ is curvature of the spine.

- A. Fracture
- B. Pectus excavatum
- C. Scoliosis
- D. Reticulation

51. The simplest form of scoliosis as seen on a CXR is physiological and related to the patient's \_\_\_\_\_ at the time of the CXR.

- A. size
- B. position
- C. gender
- D. insurance

52. In figure 5.3, Sagittal reconstruction of the chest demonstrating the **normal** \_\_\_\_\_ of the thoracic spine.

- A. size
- B. kyphotic curvature
- C. length
- D. bone content

53. Anterior wedge collapse of thoracic vertebrae causes accentuation of the thoracic kyphosis and is **commonly** found in the \_\_\_\_\_.

- A. elderly
- B. infants
- C. children
- D. teenagers

54. The CXR of an adult male in **figure 5.5** demonstrate which of the following?

- A. Fracture
- B. depressed sternum
- C. metastatic prostatic carcinoma
- D. Scoliosis

55. Which of the following can cause the reduction or absence of soft tissue that creates darker area on x-ray?

- A. mastectomy
- B. Poland's syndrome
- C. hemiplegia or polio
- D. all of the above

56. The CXR in figure 5.12 (white arrows) demonstrate which of the following?

- A. Pneumothorax
- B. Lymphoma
- C. Hemothorax
- D. Atelectasis

57. \_\_\_\_\_ is a hereditary condition that results in a biochemical abnormality of hemoglobin.  
A. Pneumothorax  
B. Sickle cell disease  
C. Hemothorax  
D. Atelectasis

58. Which of the following are CXR signs of sickle cell disease?  
A. cardiomegally  
B. sclerotic ribs  
C. end plate depression  
D. all of the above

## Chapter 6

59. The chest x-ray in figure 6.1 demonstrate which of the following?  
A. pneumothorax  
B. primary adenocarcinoma  
C. hemothorax  
D. sickle cell disease

60. The presence of fat within a lesion is a very strong indicator of a benign pathology of chest, most likely a \_\_\_\_\_.  
A. cardiomegally  
B. sclerotic ribs  
C. end plate depression  
D. hamartoma

61. When the calcification on CT/x-ray is marked with a \_\_\_\_\_ like appearance, the diagnosis of a hamartoma is usually correct (fig 6.8).  
A. "popcorn"  
B. "star"  
C. "zigzag"  
D. none of the above

62. The CXR in figure 6.9 represents which of the following?  
A. primary adenocarcinoma  
B. metastatic renal cell carcinoma  
C. hemothorax  
D. sickle cell disease

63. Which of the following are non-small cell lung cancer?  
A. adenocarcinoma  
B. squamous cell carcinoma  
C. large cell carcinoma  
D. all of the above

64. Tumors less than \_\_\_\_\_ in diameter may **not** be visible on CXR.  
A. 1 cm  
B. 10 cm  
C. 100 cm  
D. 1,000 cm

65. Small cell lung cancer tends to present with massive lymphadenopathy and/or distant metastases and \_\_\_\_\_ is routine in the staging of this tumor.  
A. cranium ultrasound  
B. skull x-ray  
C. CT brain  
D. none of the above

66. \_\_\_\_\_ is an adenocarcinoma that may populate the air-spaces causing the appearance of ground glass opacity and subsequently consolidation on CXR.
- A. Pneumothorax
  - B. Alveolar cell carcinoma
  - C. Sickle cell disease
  - D. Atelectasis

#### Chapter 7

67. Bacterial pneumonia is the growth of pathogenic bacteria within the \_\_\_\_\_.

- A. lung
- B. liver
- C. pancreas
- D. spleen

68. Pulmonary tuberculosis is caused by \_\_\_\_\_.

- A. virus
- B. fungal infection
- C. M.tuberculosis
- D. none of the above

69. High resolution CT in fig 7.2 confirmed a “tree in bud” pattern that can be found when small airways are plugged and confirmed in this case to be due to \_\_\_\_\_.

- A. viral infection
- B. fungal infection
- C. tuberculosis
- D. sickle cell disease

70. \_\_\_\_\_ spread of TB may lead to miliary TB presenting with diffuse nodules throughout the lungs.

- A. Slow
- B. Chronic
- C. Active
- D. Hematogenous

71. Which of the following are most common species of Non-tuberculous mycobacteria (NTMs) that cause pulmonary disease in humans?

- A. M.avium-intracellulare
- B. M.kansasii and M.xenopi
- C. M.fortuitum and M.chelonae
- D. all of the above

72. Pneumococcal pneumonia due to infection tends to give rise to lobar or segmental consolidation, often with an associated \_\_\_\_\_.

- A. Fracture
- B. depressed sternum
- C. pleural effusion
- D. Scoliosis

73. Figure 7.11 demonstrates \_\_\_\_\_ in a patient who had had a staphylococcal pneumonia as a child.

- A. fracture
- B. fungal infection
- C. pneumatocele
- D. sickle cell disease

#### Chapter 8

74. Patients with Asthma are prone to which of the following that may cause lung opacification and collapse?

- A. spontaneous pneumothorax
- B. pneumomediastinum
- C. mucous plugging
- D. all of the above

75. Chronic bronchitis is a disease **primarily** associated with \_\_\_\_\_.  
A. smoking  
B. alcohol  
C. drug overdose  
D. diabetes
76. As a disease of smokers, \_\_\_\_\_ usually **coexists** with the chronic bronchitis and has the opposite effect on the appearance of the lungs on CXR.  
A. pneumothorax  
B. emphysema  
C. sickle cell disease  
D. atelectasis
77. The CXR of an adult male in figure 8.4 with a long history of cigarette smoking, demonstrates the over-expanded lungs due to \_\_\_\_\_.  
A. emphysema  
B. alcohol  
C. drug overdose  
D. diabetes
78. High resolution CT in fig 8.9(white arrows) demonstrates which of the following?  
A. fracture  
B. *bronchiectasis*  
C. sickle cell disease  
D. atelectasis
79. The CXR in figure 8.11 represents a young adult female with \_\_\_\_\_.  
A. pneumothorax  
B. emphysema  
C. sickle cell disease  
D. cystic fibrosis
80. Cystic fibrosis is a \_\_\_\_\_ condition resulting in impaired ciliary motor activity and thickened secretions.  
A. slow  
B. chronic  
C. active  
D. congenital

## Chapter 9

81. Which of the following demonstrates mild to moderate degrees of fibrosis that are not detected on CXR?  
A. ultrasound  
B. MRI  
C. HRCT  
D. none of the above
82. Honeycomb destruction of the lung is primarily a feature of idiopathic pulmonary fibrosis and can be seen on CXR.  
A. TRUE  
B. FALSE
83. Which of the following disease is **almost** exclusive to women?  
A. Asthma  
B. Lymphangioleiomyomatosis (LAM)  
C. Sickle cell disease  
D. Atelectasis
84. The x-ray and HRCT images in figure 9.11 demonstrate which of the following condition?  
A. pneumothorax  
B. emphysema

- C. asthma
- D. sarcoidosis

85. \_\_\_\_\_, previously known as extrinsic allergic alveolitis, results from type 2 and type 4 hypersensitivity reactions to inhaled organic allergens.

- A. Pneumothorax
- B. Atelectasis
- C. Sickle cell disease
- D. Hypersensitivity pneumonitis (HP)

86. Chronic HP results from continued exposure to the allergen such that the inflamed lung becomes permanently damaged and fibrotic.

- A. TRUE
- B. FALSE

## Chapter 10

87. The \_\_\_\_\_ is a thin membrane that resembles to a sealed "bag" that is wrapped around the lung forming two layers.

- A. pulmonary muscle
- B. bronchial tree
- C. pleura
- D. spinal cord

88. Diseases that cause a loss of the ability of the pleural surfaces to slide over one another will have an impact on lung expansion and may present with chest wall pain related to \_\_\_\_\_.

- A. walking
- B. talking
- C. breathing
- D. eating

89. \_\_\_\_\_ describes the presence of air in the pleural space.

- A. Pneumothorax
- B. Alveolar cell carcinoma
- C. Sickle cell disease
- D. Hemothorax

90. Which of the following are **main** causes pneumothorax?

- A. trauma
- B. surgical procedure
- C. smoking
- D. A and B only

91. A pneumothorax is evident on a CXR in figure 10.2 where there is an **absence** of \_\_\_\_\_ and a defined edge to the lung.

- A. air
- B. lung markings
- C. diaphragm
- D. trachea

92. Soft tissue emphysema is readily apparent on CXR (Fig 10.4) as \_\_\_\_\_ or lines in normally relatively opaque soft tissues.

- A. radiopaque mass
- B. lucent bubbles
- C. popcorn
- D. none of the above

93. Which of the following are some of the causes of pleural effusions?

- A. Left heart failure and trauma
- B. Infection and Neoplasm
- C. Collagen vascular disease

D. all of the above

94. On an \_\_\_\_\_ CXR ((Fig 10.7), the fluid normally accumulates at the bases due to gravity with the upper margin defined by a meniscus.

- A. supine
- B. prone
- C. erect
- D. all of the above

95. If the effusion is large enough, there is apparent thickening of the pleura at the edges due to the displacement of lung from the chest wall by the fluid.

- A. TRUE
- B. FALSE

96. An \_\_\_\_\_ is an infection in the pleural space and collects turbid to thick pus.

- A. empyema
- B. alveolar cell carcinoma
- C. pneumothorax
- D. hemothorax

97. A hemothorax is the presence of \_\_\_\_\_ in the pleural space.

- A. pus
- B. blood
- C. air
- D. water

98. Long term complications of a hemothorax are chronic pleural thickening and heavy pleural calcification.

- A. TRUE
- B. FALSE

99. As seen on CXR and CT images in figure 10.18, mesothelioma is a malignant tumor of the pleura as a result of exposure to \_\_\_\_\_.

- A. smoke
- B. air
- C. asbestos
- D. pollution

100. An early sign of mesothelioma is loss of volume of the affected \_\_\_\_\_.

- A. trachea
- B. ribs
- C. hemithorax
- D. sternum

## Chapter 11

101. Long standing left heart failure results in a progressive enlargement of the left ventricle and left atrium called \_\_\_\_\_.

- A. hepatomegaly
- B. cardiomegally
- C. cardiac arrest
- D. arteriosclerosis

102. CXR evidence for enlargement of the left atrium includes (Fig 11.2, 11.3) which of the following?

- A. enlargement of the left atrial appendage affecting the left heart border
- B. a double right heart border caused by the projection of the right wall of the left atrium
- C. widening of the carina
- D. all of the above

103. In right heart failure, there is an increase in the pressure within the capillary bed of the lung resulting in the accumulation of fluid in the lung interstitium.

- A. TRUE

B. FALSE

104. Septal lines are best seen at the \_\_\_\_\_, where each diaphragm joins the chest wall.

- A. costophrenic angles
- B. lung apices
- C. costosternal joint
- D. clavicles

## Chapter 12

105. Recognition of cardiac abnormalities on a CXR depends on which of the following?

- A. changes in the mediastinal silhouette
- B. observing the effect of the abnormality on the lung vasculature
- C. bone mineral contents
- D. A and B only

106. Coarctation of the aorta typically occurs at the \_\_\_\_\_ just distal to the arch.

- A. trachea
- B. diaphragm
- C. isthmus
- D. clavicle

107. Fallot's tetralogy describes which of the following cardiac abnormalities?

- A. overriding aorta and pulmonary stenosis
- B. ventricular septal defect
- C. right ventricular hypertrophy
- D. all of the above

108. Supine CXR of an infant (fig 12.3) with Fallot's tetralogy demonstrates the \_\_\_\_\_ heart due to right ventricular hypertrophy and an overriding aorta.

- A. boot shaped
- B. calcified
- C. radiopaque
- D. dense

109. \_\_\_\_\_ of the heart is assessed on a CXR by measuring its maximum diameter (Fig 12.4).

- A. Pacemaker
- B. Cardiomegally/Enlargement
- C. Blood vessels
- D. Arteriosclerosis

110. A \_\_\_\_\_ is the accumulation of fluid, usually blood stained, in the potential space between the two layers of pericardium.

- A. ventricular septal defect
- B. pericardial effusion
- C. arteriosclerosis
- D. none of the above

111. The most obvious signs of pericardial effusions are a change in the shape of the heart to a more rounded contour (the globular heart) and a rapid increase in size of the cardiac silhouette.

- A. TRUE
- B. FALSE

112. Which of the following are causes of pericardial calcification?

- A. Pericarditis (TB, rheumatic fever, viruses)
- B. Post-traumatic events
- C. Uremia
- D. all of the above

113. Calcification en-face to the X-ray beam is difficult to appreciate but will be readily apparent (Fig 12.7) on a \_\_\_\_\_ CXR.
- A. PA
  - B. AP
  - C. decubitus
  - D. lateral

### Chapter 13

114. The CXR in acute pulmonary embolus (PE) is often normal and its main value is in identifying other possible causes for the symptoms thought to be due to a PE.
- A. TRUE
  - B. FALSE

### Chapter 14

115. There are many soft tissues within the mediastinum all of which may give rise to \_\_\_\_\_.
- A. fractures
  - B. calcifications
  - C. tumors
  - D. pus collection
116. The anterior mediastinum contains which of the following?
- A. heart
  - B. thymic region
  - C. pericardium
  - D. all of the above
117. Which of the following are causes of middle mediastinum masses?
- A. aneurysm of aorta and tumor of trachea or main bronchi
  - B. duplication-bronchogenic cyst
  - C. esophageal lesions-achalasia/ hiatus hernia
  - D. all of the above
118. Nodal enlargement increases the density and size of the \_\_\_\_\_ (Fig 14.2, 14.3).
- A. lungs
  - B. hilum
  - C. liver
  - D. diaphragm

### Chapter 15

119. The chest x-rays of an adult male following a road traffic accident in figure 15.1 demonstrate which of the following?
- A. lung contusion
  - B. laceration
  - C. fractures
  - D. all of the above
120. The chest x-rays in figures 15.3, 15.6 and 15.7 demonstrate what?
- A. Bullet wounds
  - B. Aneurysm of aorta
  - C. Pericarditis
  - D. Uremia