

1. Which of the following is incorrect pertaining to the ribs?
 - A) The first 7 are referred to as vertebrosteral ribs.
 - B) Ribs 11 and 12 are typically “floating” (vertebral, free) ribs.
 - C) The tubercle of a typical rib attaches to the inferior articular facet of the corresponding vertebrae.
 - D) The head of a typical rib articulates with the bodies of two vertebrae.
 - E) The costal groove is associated with the intercostal vessels and nerve.

2. Rib fractures:
 - A) are more likely to occur in children than adults.
 - B) are most likely to occur at the junction of the rib and its corresponding vertebrae.
 - C) most often occur in the 1st rib.
 - D) in the lower ribs may be associated with tearing of the diaphragm.
 - E) are not typically painful.

3. The sternal angle:
 - A) indicates the location of the joint between the costal cartilage of the 2nd rib and the sternum.
 - B) occurs where the 1st rib attaches to the sternum.
 - C) is the least likely part of the sternum to fracture in the elderly.
 - D) occurs at the sternoclavicular joint.
 - E) is a depression in the body of the sternum.

4. Which of the following is incorrect pertaining to the sternum?
 - A) It may be surgically split in the median plane to gain access to the thoracic cavity.
 - B) It may be used for a bone marrow biopsy.
 - C) It may have a perforation (sternal foramen) that is sometimes the site of a pleural herniation, which is a life-threatening situation.
 - D) In violent thoracic trauma (e.g., automobile accident), comminuted fractures are not uncommon.
 - E) Its xiphoid process may partially ossify, producing a pronounced lump.

5. The superior thoracic aperture:
 - A) is bounded posteriorly by the axis.
 - B) is bounded anterolaterally by the clavicle.
 - C) is bounded anteriorly by the trachea.
 - D) is a larger opening than the inferior thoracic aperture.
 - E) is, anatomically, the thoracic inlet.

6. Which of the following associations is incorrect?
- A) rib separation—separation of a rib and its costal cartilage
 - B) rib dislocation (slipping rib syndrome)—separation of a costal cartilage from the sternum
 - C) joints between costal cartilage of ribs 2–7 and sternum—symphyses
 - D) rib movements—mostly around a transverse axis passing through the head, neck, and tubercle
 - E) rib movements—increase A-P diameter of the thorax during respiration
7. Which of the following associations is incorrect?
- A) serratus posterior superior—potentially can elevate superior ribs
 - B) scalenus anterior—stabilizes 1st rib enabling more effective rib elevation during forced inspiration
 - C) external intercostal muscles—attach to the sternum
 - D) intercostal vessels and nerve—travel between internal and innermost intercostals muscles
 - E) diaphragm—primary muscle of respiration
8. The endothoracic fascia:
- A) is continuous with the clavipectoral fascia.
 - B) provides a surgical cleavage plane between the thoracic wall and the costal parietal pleura.
 - C) attaches to the suspensory ligaments of the breast.
 - D) contains the intercostal muscles.
 - E) may become fibrous and thus interfere with normal respiratory movements.
9. A patient complains to you of pain in a limited strip on one side of his chest and back. Upon examination you notice that the skin associated with the T3 dermatome of that side is red with vesicular eruptions. Which of the following is your most reasonable conclusion about your patient's illness?
- A) He has syphilis.
 - B) He has shingles (herpes zoster).
 - C) He has localized dermatitis.
 - D) An underlying thoracic disease has spread through the thoracic wall to the skin.
 - E) It is likely that the condition will spread to surrounding dermatomes before it improves.

10. Which of the following is incorrect pertaining to the internal thoracic (mammary) artery?
- A) It helps supply the breast via its anterior intercostal branches.
 - B) It passes anterior to the clavicle.
 - C) It lies superficial to the slips of the transverse thoracic muscle.
 - D) It is in contact with the parietal pleura.
 - E) It terminates in the 6th intercostal space by becoming the superior epigastric and musculophrenic arteries.
11. A women patient complains to you that her breasts have a strange appearance. Upon examination you notice dimples in the skin of her breast. You know that the most likely explanation for these dimples (peau d' orange sign) is:
- A) interference with lymph drainage.
 - B) pregnancy.
 - C) overproduction of milk.
 - D) menopause.
 - E) bacterial infection of the lactiferous ducts (ductus lactiferi).
12. Lymphatic drainage of the breast:
- A) is principally to the ipsilateral parasternal lymph nodes.
 - B) and ultimately from both breasts enters the thoracic duct.
 - C) is principally to the ipsilateral internal thoracic vein.
 - D) is principally to the ipsilateral axillary nodes.
 - E) is principally to the ipsilateral lymph vessels running deep to the pectoralis major.
13. Simple mastectomy for breast cancer involves removal of:
- A) all breast tissue and the underlying muscles.
 - B) the nipple and areola.
 - C) only one breast quadrant.
 - D) all breast tissue superficial to the retromammary space.
 - E) all of the lymph nodes that drain the breast.
14. Your examination of a male patient reveals a tender subareolar mass in his breast. Which of the following conditions is most likely based on this finding?
- A) gynecomastia
 - B) Klinefelter's syndrome
 - C) cancer
 - D) shingles
 - E) fibrous atrophy of his pectoralis major

15. It is common to explain the relationships between the lung and surrounding structures by using the analogy of a fist inserted into a balloon. Accordingly, which of the following group of associations would be accurate?
- A) fist—pleural cavity; space between inner and outer balloon layers—mediastinum; outer layer of balloon—endothoracic fascia
 - B) fist—lung; space between inner and outer balloon layers—pleural cavity; outer layer of balloon—endothoracic fascia
 - C) fist—lung; space between inner and outer balloon layers—pleural cavity; outer layer of balloon—parietal pleura
 - D) fist—lung; space between inner and outer balloon layers—pleural cavity; outer layer of balloon—visceral pleura
 - E) fist—pleural cavity; inner layer of balloon—visceral pleural; space between inner and outer balloon layers—endothoracic surgical plane
16. Pertaining to the pleura, the:
- A) diaphragmatic pleura is part of the visceral pleura.
 - B) suprapleural membrane is part of the parietal pleura.
 - C) costodiaphragmatic recess is larger during inspiration than during expiration.
 - D) costal pleural reflection passes obliquely across the 6th rib in the midclavicular line, the 8th rib in the midaxillary line, and the 10th rib at its neck.
 - E) parietal and visceral layers of pleura are continuous at the pulmonary ligament.
17. A plain radiograph of a patient following a knife wound to the left side of his neck showed elevation of the left hemidiaphragm, narrowing of the left intercostals spaces, and displacement of the trachea to the left. You suspect:
- A) hemothorax due to blood from the wound.
 - B) pneumothorax due to knife penetration of the cervical pleura.
 - C) transection of the phrenic nerve.
 - D) transection of the sympathetic trunk.
 - E) pleurisy.
18. Which of the following would be the safest locations to insert a needle for thoracocentesis of the pleural cavity during expiration?
- A) immediately superior to the 10th rib at the midaxillary line
 - B) immediately inferior to the 9th rib at the midaxillary line
 - C) immediately superior to the 5th rib at the midclavicular line
 - D) between the costal cartilages of the left 4th and 5th ribs
 - E) between the costal cartilages of the right 4th and 5th ribs

19. During auscultation of the lungs:
- A) it is normal to hear the sliding of the parietal and visceral layers of pleura.
 - B) it is normal to hear the movement of the pleural fluid.
 - C) pleural rub sounds indicate pleuritis or pleurisy.
 - D) pleural rub sounds indicate a loss of negative pressure in the pleural cavity.
 - E) pleural rub sounds indicate pneumonia.
20. Which of the following is incorrect pertaining to the surface anatomy of the lungs?
- A) Typically, the right lung has three lobes, and the left lung has two.
 - B) The lingula extends into and out of the costodiaphragmatic recess during respiration.
 - C) Vascular and nervous structures enter each lung at its hilum.
 - D) The apex of each lung is in contact with the diaphragm.
 - E) The mediastinal surface of each lung is related to the heart and pericardium.
21. Which of the following is incorrect pertaining to bronchopulmonary segments?
- A) Each is separated from adjacent segments by visceral pleura.
 - B) Each is supplied independently by a tertiary bronchus and tertiary branch of the pulmonary artery.
 - C) Each is surgically resectable.
 - D) Each is drained by intersegmental parts of the pulmonary veins that lie in the tissue between segments.
 - E) There are approximately eight to ten in each lung.
22. Spread of bronchiogenic carcinoma to the bronchiomediastinal lymph nodes might be indicated by:
- A) loss of cough reflex.
 - B) pleurisy.
 - C) distorted and displaced carina.
 - D) fluid sounds upon lung percussion.
 - E) segmental atelectasis.
23. Which of the following is incorrect pertaining to any bronchial artery or vein?
- A) drains to the azygos vein
 - B) supplies lung tissue
 - C) arises from the pulmonary trunk
 - D) supplies the esophagus
 - E) supplies visceral pleura

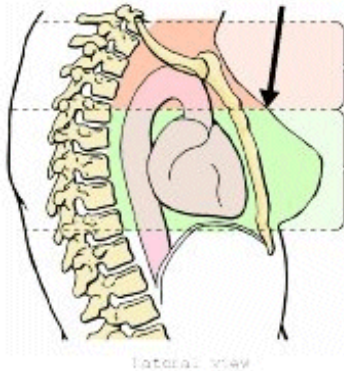
24. Almost immediately following a compound fracture of the femur in an automobile accident, an otherwise healthy patient suffered severe respiratory distress and died. The most likely cause of death was:
- A) loss of blood.
 - B) infection.
 - C) pulmonary fat embolism.
 - D) sympathetic overactivity.
 - E) myocardial infarction.
25. Which of the following pertaining to lung (bronchiogenic) carcinoma is least likely?
- A) a persistent cough
 - B) spitting of blood (hemoptysis)
 - C) metastasis to bronchopulmonary nodes
 - D) enlarged supraclavicular nodes
 - E) enlarged axillary nodes
26. Which of the following is incorrect pertaining to the innervation of the lung or any part of the pleura?
- A) It receives both sympathetic and parasympathetic fibers.
 - B) Cough reflex fibers (visceral afferents) accompany the vagus nerve.
 - C) Pain fibers supplied by intercostal nerves.
 - D) Pain can be referred to the shoulder.
 - E) Intrinsic smooth muscle is supplied by phrenic nerve.
27. Which of the following is incorrect pertaining to the anatomy of the lung and/or pleura?
- A) The parietal pleural generally extends three ribs inferior to the lung.
 - B) The bifurcation of the trachea occurs approximately at the level of the sternal angle.
 - C) The right main bronchus is wider and more vertical than the left.
 - D) Each main bronchus supplies a lung.
 - E) The right lung has a horizontal fissure.

28. In the following PA radiograph of the thorax, the arrow points to:



- A) the stomach.
- B) the dome of the right hemidiaphragm.
- C) the 12th rib.
- D) the lower margin of the left lung.
- E) the lower margin of the right lung.

29. In the following illustration, the arrows points to a line that represents the:



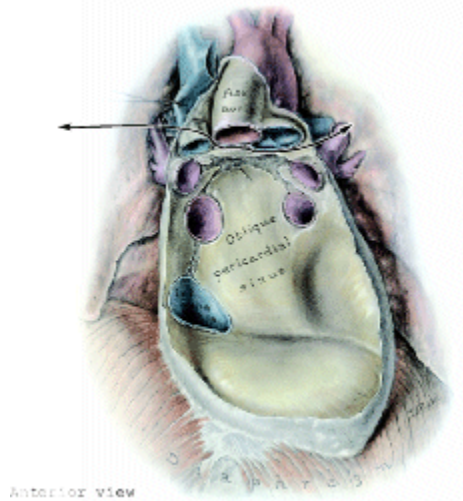
- A) separation between the superior thoracic aperture and the mediastinum.
- B) separation between the superior mediastinum and the inferior mediastinum.
- C) separation between the superior and inferior thoracic lymph drainage areas.
- D) separation between the axillary and abdominal lymph drainage of the breast.
- E) level of the jugular notch.

30. All of the following are true of the mediastinum except:

- A) it consists primarily of hollow (air or liquid filled) visceral structures.
- B) it contains the lungs.
- C) it has relationships that change depending on whether the patient is in the upright or supine position.
- D) when widened inferiorly, it may indicate heart failure.
- E) it contains lymph nodes.

31. Which of the following is incorrect pertaining to the pericardium?
- A) It consists of visceral and parietal layers of serous pericardium, and the fibrous pericardium.
 - B) The visceral and parietal layers of the serous pericardium are continuous around the aorta and pulmonary trunk where they exit the heart.
 - C) It is mainly supplied with blood from the pericardiophrenic artery.
 - D) It has pain fibers that are conveyed by the intercostal nerves.
 - E) It encloses the terminal part of the inferior vena cava.
32. Cardiac tamponade refers to:
- A) the effect of a pneumothorax on the heart.
 - B) the buildup of fluid in the pericardial cavity that impedes the pumping of the heart.
 - C) the rustle-of-silk sound heard in a stethoscope when there is pericarditis.
 - D) pericardial calcification.
 - E) pain from a heart attack.
33. Which of the following is incorrect pertaining to the apex of the heart?
- A) It is formed by the inferolateral part of the left ventricle.
 - B) Typically it lies posterior to the left 5th intercostal space in adults.
 - C) It underlies the site where the “heartbeat” may be auscultated on the thoracic wall.
 - D) It is where the sounds of the mitral valve closure are maximal (apex beat).
 - E) It is bisected by the coronary groove.

34. In the following illustration, the arrow traverses the:



- A) transverse pericardial sinus.
- B) oblique pericardial sinus.
- C) costopericardial recess.
- D) pericardial venous sinus.
- E) sinus venosus.

35. Which of the following associations is incorrect?

- A) right border of the heart—right atrium
- B) diaphragmatic surface of the heart—mainly left ventricle
- C) left border of the heart—mainly left atrium
- D) anterior surface of the heart—mainly right ventricle
- E) superior border—right and left atria and auricles

36. Which of the following structures is not associated with the right atrium?

- A) crista terminalis
- B) pectinate muscles
- C) oval fossa (fossa ovalis)
- D) opening of coronary sinus
- E) tendinous chords (chordae tendineae)

37. The septomarginal trabeculae (moderator band) is important because it:

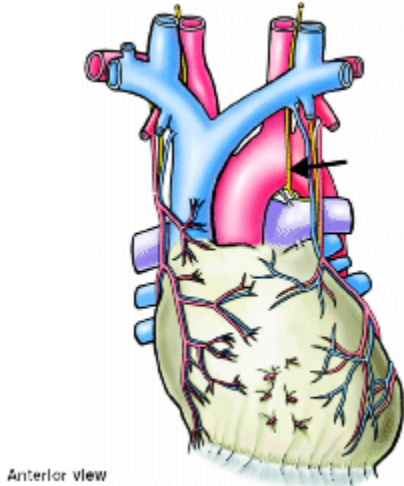
- A) conducts subendocardial branches (Purkinje fibers) from the AV node to the anterior papillary muscle.
- B) funnels the blood of the right ventricle into the infundibulum.
- C) is the thickest part of the myocardium of the left ventricle.
- D) prevents blood during systole from reentering the left atrium.
- E) provides the fibrous skeleton to which the heart valves are attached.

38. The mitral valve:
- A) is located between the right atrium and ventricle.
 - B) has cusps attached to pectinate muscles.
 - C) has three cusps.
 - D) is associated with a condition (mitral valve prolapse) in which blood regurgitates into the left atrium when the left ventricle contracts.
 - E) is located posterior to the sternum at the level of the 2nd costal cartilage.
39. Stenosis of the aortic valve is associated with all of the following except:
- A) turbulence as the blood exits the heart.
 - B) murmurs heard with a stethoscope.
 - C) thrills felt on the surface of the chest.
 - D) acute occurrence.
 - E) left ventricular hypertrophy.
40. "Dominance" of the coronary arterial system is determined by the coronary artery that:
- A) is larger.
 - B) supplies the AV node.
 - C) supplies the SA node.
 - D) supplies the posterior interventricular artery (posterior descending artery).
 - E) branches first from the aorta.
41. The right coronary artery typically:
- A) supplies both the AV and SA nodes.
 - B) supplies most of the interventricular septum.
 - C) has a circumflex branch.
 - D) passes to the left side of the pulmonary trunk after arising from the right aortic sinus.
 - E) supplies the fibrous pericardium.
42. Following a heart attack you tell a patient that he now has a myocardial infarction. You explain this as:
- A) a blockage of his smallest cardiac veins (venae cordae minimae).
 - B) an area of his myocardium that is necrotic.
 - C) an area of his myocardium that is fibrillating.
 - D) an area of his myocardium that is paradoxically contracting.
 - E) an area of his myocardium that is edematous.

43. In the emergency room you examine a patient experiencing angina pectoris. Which of the following is least likely to be associated with your patient?

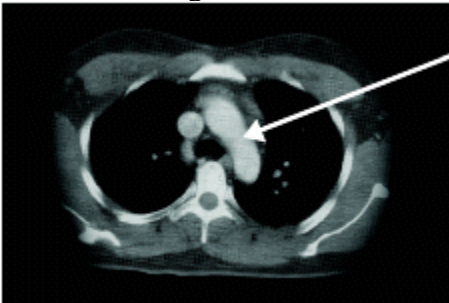
- A) severe, crushing pain deep to the sternum
- B) ischemia to a part of his myocardium
- C) a partial or complete blockage of a coronary artery
- D) decreased oxygen exchange in the lungs
- E) pain relief with rest

44. In the following illustration, the arrow points to the:



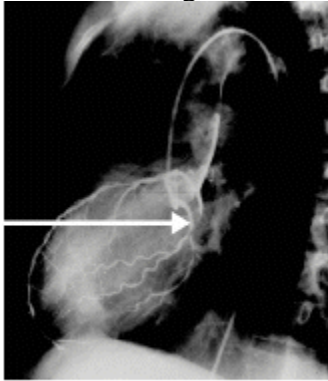
- A) left vagus nerve.
- B) left sympathetic trunk.
- C) left phrenic nerve.
- D) left internal thoracic artery.
- E) hemiazygos vein.

45. In the following CT of the chest, the arrow points to the:



- A) arch of the azygos vein.
- B) arch of the aorta.
- C) left atrium.
- D) left ventricle.
- E) pulmonary trunk.

46. In the following left lateral view of an aortic angiogram, the arrow points to the:



(A) Left lateral view

- A) right coronary artery.
 - B) circumflex artery.
 - C) posterior interventricular artery.
 - D) artery to the SA node.
 - E) coronary sinus.
47. All of the following are true pertaining to coronary bypass surgery except:
- A) it can only be done after a coronary angioplasty procedure.
 - B) a segment of the saphenous vein is often used to bypass the obstructed segment of the affected coronary artery.
 - C) the internal thoracic artery may be used to directly supply the distal segment of a coronary artery.
 - D) it is done in cases of coronary artery stenosis.
 - E) when a vein is used to shunt the blood around the obstructed segment, it has to be reversed so that the valves do not impede the flow of blood.
48. Which of the following associations is incorrect?
- A) great cardiac vein—ascends parallel to the anterior interventricular artery
 - B) middle cardiac vein—ascends parallel to the posterior interventricular artery
 - C) anterior cardiac veins—terminate in the coronary sinus
 - D) oblique vein of left atrium—terminates by forming coronary sinus with great cardiac vein
 - E) coronary sinus—traverses the posterior aspect of the coronary groove

49. Which of the following is not true of the SA node?
- A) It is located at the junction of the superior vena cava and right atrium near the superior end of the sulcus terminalis.
 - B) It is the pacemaker of the heart.
 - C) It sends impulses directly to the interventricular bundle of subendocardial branches (fibers).
 - D) It receives sympathetic impulses from the first five to six thoracic segments that accelerate its basal rate.
 - E) It receives parasympathetic impulses from the vagus nerve that decrease its basal rate.
50. A moderately obese 55-year-old woman wishes to start an exercise program. She seeks your advice prior to beginning this program, and you recommend that she have a treadmill stress test. Which of the following is incorrect pertaining to this test?
- A) The impulses generated by her SA node will be monitored.
 - B) Blood pressure will be monitored.
 - C) Pulse rate will be monitored.
 - D) Treadmill speed will be increased during the progression of the test.
 - E) The results of the test show the minimal heart rate the patient should strive for while exercising.
51. All of the following may be associated with a "heart block" except:
- A) section of the superior part of the thoracic sympathetic trunk.
 - B) coronary artery disease.
 - C) loss of synchrony between atrial and ventricular contractions.
 - D) use of an artificial pacemaker.
 - E) ventricular fibrillation.
52. Which of the following is incorrect pertaining to the pattern of referred pain typically associated with angina pectoris?
- A) may be felt in left shoulder
 - B) may be felt in area of left upper limb supplied by medial brachial cutaneous nerve
 - C) may be felt in the right shoulder
 - D) may be felt in left fingers
 - E) may be felt in back

53. Which of the following is incorrect pertaining to the arch of the aorta?
- A) It begins and ends at the same transverse level.
 - B) It passes over the root of the left lung.
 - C) The ligamentum arteriosum connects to the superior aspect of the arch at its most superior point.
 - D) It gives rise to the left common carotid artery posterior to the manubrium.
 - E) It may give rise to an artery that directly supplies the thyroid gland.
54. Which of the following is incorrect pertaining to coarctation of the aorta?
- A) It is typically associated with reduced blood flow to the brain.
 - B) It refers to a narrowing of the aorta.
 - C) It typically occurs near the site of the attachment of the ligamentum arteriosum.
 - D) It may be associated with enlarged internal thoracic and intercostal arteries.
 - E) It may be associated with osteological changes in the ribs that are visible radiologically.
55. Which of the following is not true of the right vagus nerve?
- A) It passes anterior to the right subclavian artery.
 - B) It gives rise to the right recurrent laryngeal nerve.
 - C) It passes posterior to the root of the right lung.
 - D) It gives a branch to the right pulmonary plexus.
 - E) It gives rise to a branch that supplies sensory innervation to the diaphragm.
56. Which of the following is not true of the left phrenic nerve?
- A) It traverses the superior mediastinum between left subclavian and common carotid arteries.
 - B) It crosses anterior to the arch of the aorta.
 - C) It passes posterior to the root of the left lung.
 - D) It supplies motor fibers to the diaphragm.
 - E) It pierces the diaphragm.
57. The esophagus:
- A) contains cartilaginous rings.
 - B) enters the superior mediastinum anterior to the trachea.
 - C) in the superior mediastinum is in contact with the thoracic duct on its left.
 - D) inclines to the right as it nears the diaphragm.
 - E) traverses the diaphragm at the T8 level.

58. Which of the following group of three structures may cause apparent “constrictions” of the esophagus on an oblique chest radiograph after the patient has swallowed barium?
- A) arch of the aorta, left main bronchus, diaphragm
 - B) arch of the azygos vein, left main bronchus, diaphragm
 - C) left brachiocephalic vein, arch of the azygos vein, diaphragm
 - D) arch of the aorta, left main bronchus, left main pulmonary vein
 - E) left brachiocephalic vein, arch of the aorta, left main pulmonary vein
59. During surgery to remove a metastasis from the posterior aspect of the left lung, the surgical field began to fill with a clear to milky fluid. Which of the following had most likely occurred?
- A) The surgeon had penetrated the pleural cavity allowing its fluid to flow into the surgical field.
 - B) The surgeon had penetrated the pericardial cavity allowing its fluid to flow into the surgical field.
 - C) The surgeon had lacerated the thoracic duct.
 - D) The surgeon had lacerated the right auricle of the heart.
 - E) The surgeon had lacerated the left main bronchus.
60. Which of the following is not correct pertaining to the azygos venous system?
- A) It drains blood from the posterior walls of the thorax and abdomen.
 - B) The azygos vein arches superior to the root of the right lung.
 - C) The hemiazygos vein receives tributaries from the left posterior intercostal veins.
 - D) It forms an alternate route for venous blood to return to the heart when the inferior vena cava is blocked.
 - E) The hemiazygos vein arches superior to the root of the left lung.
61. Which of the following is not typically visible in a PA chest radiograph?
- A) the interventricular septum
 - B) the right border of the heart
 - C) the left border of the heart
 - D) the terminal part of the arch of the aorta (aortic knob)
 - E) both clavicles
62. Which of the following associations is incorrect?
- A) coronary angiography—shows stenosis in coronary arteries
 - B) echocardiogram—shows valvular stenosis and regurgitation
 - C) iodine contrast enhanced CT—shows breast cancer
 - D) Doppler echocardiogram—shows efficiency of oxygen exchange
 - E) fluoroscopy—shows paradoxical movements of diaphragm

63. The “bare area” within the thorax refers to:
- A) a deviation in the left sternal reflection of the pleural that facilitates needle puncture of the pericardial cavity without penetration of the left lung or pleural cavity.
 - B) a deviation in the right sternal reflection of the pleural that facilitates needle puncture of the pericardial cavity without penetration of the right lung or pleural cavity.
 - C) a deviation in the right costal reflection of the pleural that facilitates needle puncture of the liver without penetration of the right lung or pleural cavity.
 - D) the area of the heart that is in direct contact with the sternum.
 - E) an area of continuity between both pleural cavities and the heart.
64. Which of the following is incorrect pertaining to the thoracic sympathetic trunk?
- A) It is in continuity with the cervical and lumbar sympathetic trunks.
 - B) It lies against the heads of the ribs in the superior part of the thorax.
 - C) It only supplies postganglionic sympathetic fibers to thoracic viscera.
 - D) It gives rise to the greater, lesser, and least splanchnic nerves.
 - E) It has white and gray rami at each level.
65. A former construction worker who remodeled old buildings that contained asbestos insulation is found to have a malignancy growing from the visceral pleura of the lingula. In which of the following lung lobes is the tumor located?
- A) right middle
 - B) left upper
 - C) right lower
 - D) right upper
 - E) left lower

Answer Key

1. C
2. D
3. A
4. C
5. E
6. C
7. C
8. B
9. B
10. B
11. A
12. D
13. D
14. C
15. C
16. E
17. B
18. A
19. C
20. D
21. A
22. C
23. C
24. C
25. E
26. E
27. A
28. B
29. B
30. B
31. D
32. B
33. E
34. A
35. C
36. E
37. A
38. D
39. D
40. D
41. A
42. B
43. D
44. A

- 45. B
- 46. B
- 47. A
- 48. C
- 49. C
- 50. E
- 51. A
- 52. D
- 53. C
- 54. A
- 55. E
- 56. C
- 57. C
- 58. A
- 59. C
- 60. E
- 61. A
- 62. D
- 63. A
- 64. C
- 65. B