Name:_____ Class:_____ Date:_____

CHAPTER 2 - ANATOMY OF RESPIRATION

1. Which of the following is defined as the exchange of oxygen between an organism and its environment?
   a. Elimination b. Expiration
   c. Respiration d. Inspiration

ANSWER: c

2. Gas exchange occurs within the minute air sacs of the lungs called
   a. alveoli. b. trachea.
   c. bronchi. d. terminal bronchioles.

ANSWER: a

3. Pressure is defined as
   a. F = P/A. b. F = A/P.
   c. F = P x A/P. d. none of the above.

ANSWER: a

4. Boyle's law states that
   a. given a constant temperature and pressure, increasing the number of molecules in a container will increase the pressure.
   b. given a volume of gas, increasing the pressure on the gas will increase the number of molecules in the gas.
   c. given a gas of constant temperature, increasing the volume of the chamber in which the gas is contained will decrease the pressure.
   d. none of the above.

ANSWER: c

5. When the volume of a closed container such as a hypodermic needle is increased,
   a. pressure increases.
   b. pressure decreases.
   c. Boyle's law is violated.
   d. air or liquid will be sucked into the hypodermic needle.

ANSWER: b

6. The lungs are housed within the
   a. abdominal region. b. sternal cavity.
   c. diaphragm. d. thorax.

ANSWER: d

7. The lateral aspect of the thorax is made up of the
   a. rib cage. b. diaphragm.
   c. sternum and clavicle. d. scapula.

ANSWER: a

8. The functional unit of the vertebral column is the
   a. spinous process. b. vertebrae.
   c. lateral process. d. vertebral canal.

ANSWER: b

CHAPTER 2 - ANATOMY OF RESPIRATION

9. How many cervical vertebrae are there in the human body?
   a. 12 b. 6
   c. 4 d. 7
ANSWER: d

10. How many thoracic vertebrae are there in the human body?
   a. 17 b. 7
   c. 12 d. 8
ANSWER: c

11. How many lumbar vertebrae are there in the human body?
   a. 8 b. 4
   c. 6 or 7 d. None of the above
ANSWER: d

12. How many sacral vertebrae are there in the human body?
   a. 5 b. 7
   c. 12 d. None of the above
ANSWER: a

13. Which process forms the palpable aspect of the vertebral column?
   a. Lateral b. Costal
   c. Spinous d. Anterior
ANSWER: c

14. Which processes form the primary attachment of the rib to the vertebral column?
   a. Transverse b. Costal
   c. Vertebral d. Posterior
ANSWER: a

15. Which is the channel through which the spinal cord passes?
   a. Vagal formation b. Foramen ovale
   c. Alveolar portion d. Vertebral foramen
ANSWER: d

16. Spinal nerves exit the spinal cord via the
   a. vagal trigone. b. foramen magnum.
   c. intervertebral foramen. d. pterygoid fossa.
ANSWER: c

17. The odontoid process is present only on the
   a. second cervical vertebra. b. second thoracic vertebra.
   c. second lumbar vertebra. d. second sacral vertebra.
ANSWER: a

CHAPTER 2 - ANATOMY OF RESPIRATION

18. C1 is termed the
    a. axis. b. atlas.
    c. apex. d. none of the above.
ANSWER: b

19. The pelvic girdle is comprised of the ilium, sacrum, pubic bone, and
    a. ischium. b. sacroiliac.
    c. icthic bone. d. sarcoid unit.
ANSWER: a

20. Which of the following forms the superior attachment for the inguinal ligament?
    a. Transverse process of S5 b. Sacral ridge
    c. Pubic symphysis d. Iliac crest
ANSWER: d

21. Which is the inferior-most component of the vertebral column?
    a. Coccyx b. Sacrum
    c. Pubic symphysis d. Sacral ridge
ANSWER: a

22. The pectoral girdle consists of the scapula and
    a. sternum.
    b. cervical portion of the vertebral column.
    c. clavicle.
    d. inguinal ligament.
ANSWER: c

23. There is/are how many floating ribs?
    a. 1 b. 2
    c. 3 d. 4
ANSWER: b

24. There are how many true ribs?
    a. 12 b. 7
    c. 5 d. 3
ANSWER: b

25. At rest, the rib cage slopes
    a. downward. b. upward.
    c. laterally. d. transversely.
ANSWER: a

26. A relative increase in air pressure over atmospheric pressure is known as _____ pressure.
ANSWER: positive

CHAPTER 2 - ANATOMY OF RESPIRATION

27. A relative decrease in air pressure under atmospheric pressure is known as _____ pressure.
ANSWER: negative

28. The _____ of the sternum is the point of attachment for the first rib and clavicle.
ANSWER: manubrium

29. The _____ of the sternum is the largest component, forming the point of attachment for all but one of the true ribs.
ANSWER: Corpus

30. The _____ process is the inferior-most aspect of the sternum.
ANSWER: ensiform
xiphoid

31. The _____ is a flexible tube beneath the larynx, forming the first passageway to the lungs.
ANSWER: trachea

32. The _____ is the point of bifurcation of the trachea.
ANSWER: carina
carina tracheae

33. The esophagus is (anterior/posterior) _____ to the trachea.
ANSWER: posterior

34. The (left/right) _____ lung has two lobes.
ANSWER: left

35. Secondary bronchi serve the _____ of the lungs.
ANSWER: lobes

36. Tertiary bronchi serve the _____ of the lungs.
ANSWER: segments

37. Alveoli are located at the ends of the _____ bronchioles.
ANSWER: terminal

38. During inspiration, the diaphragm is contracted, which causes it to (elevate/depress) _____.
ANSWER: depress

39. During inspiration, the inspiratory muscles of the rib cage contract, causing the rib cage to (elevate/depress) _____.
ANSWER: elevate

40. When the rib cage becomes smaller during respiration, air will flow (into/out of) _____ the lungs.
ANSWER: out of

41. The term used for a punctured lung is _____.

ANSWER: pneumothorax

42. The _____ lining completely envelops the lungs and the interior thoracic wall.
ANSWER: pleural

43. The _____ pleurae cover the surface of the lungs.
ANSWER: parietal

44. The _____ pleurae cover the rib cage.
ANSWER: costal

45. When the serous fluid between the pleural linings is lost or reduced, a person is said to have _____.
ANSWER: pleurisy

46. The space holding the heart is termed the _____.
ANSWER: mediastinum

47. The _____ nerve innervates the diaphragm.
ANSWER: phrenic

48. The _____ attachment of the diaphragm is the anterior-most point of origin of this muscle.
ANSWER: sternal

49. The _____ tendon is the point of insertion for all muscle fibers of the diaphragm.
ANSWER: central

50. The diaphragm muscle fibers arising from the _____ point of attachment encircle the esophagus as they transit to the central tendon.
ANSWER: vertebral

51. When the diaphragm contracts, the central tendon (elevates/depresses) _____.
ANSWER: depresses

52. The phrenic nerve arises from the _____ plexus.
ANSWER: cervical

53. The _____ intercostal muscles are muscles of inspiration.
ANSWER: external

54. The _____ portion of the internal intercostal muscles is involved in inspiration.
ANSWER: interchondral
chondral

55. The _____ intercostal muscles are primarily involved in expiration.
ANSWER: internal

56. The external intercostal muscles (elevate/depress) _____ the rib cage.

ANSWER: elevate

57. The serratus posterior superior muscles (elevate/depress) _____ the rib cage.
ANSWER: elevate

58. The _____ muscle elevates the sternum and clavicle, and also rotates the head.
ANSWER: sternocleidomastoid

59. The _____ muscle is actually a muscle of the arm, and elevates the rib cage by means of sternal and clavicular muscular components.
ANSWER: pectoralis major

60. The _____ muscle is a massive muscle of inspiration making up the superficial upper back and neck; it originates along the spinous processes of C2 to T12 by means of fascial connection.
ANSWER: trapezius

61. The _____ muscles are posterior thoracic muscles of inspiration that elevate the rib cage. Each portion originates on a transverse process of a vertebra (from C7 through T11), for a total of 12 muscles. Fibers course obliquely down and out to insert into the tubercle of the rib below.
ANSWER: levator costarum brevis

62. The _____ muscle originates on the spinous processes of C7 and T1 through T3. Fibers from these muscles course down and laterally to insert just beyond the angles of ribs 2 through 5. This group of muscles elevates the rib cage during inspiration.
ANSWER: serratus posterior superior

63. The _____ muscle is found on the inner surface of the rib cage, originating on the margin of the sternum, with fibers coursing to the inner chondral surface of ribs 2 through 6. Contraction of this muscle resists elevation of the rib cage and decreases the volume of the thoracic cavity.
ANSWER: transversus thoracis

64. The _____ muscles originate on the spinous processes of the T11, T12, and L1 through L3 vertebrae and course up and laterally to insert into the lower margin of the lower five ribs. Contraction of these muscles pulls the rib cage down for expiration.
ANSWER: serratus posterior inferior

65. The _____ hiatus is the opening of the diaphragm that permits connection of the pharyngeal region with the stomach.
ANSWER: esophageal

66. What are the three major structures of respiration?
ANSWER: The three major structures of respiration are:
1. **Bony thorax,** which contains the vertebrae, vertebral column, ribs, pectoral girdle, sternum, and pelvic girdle.
2. **Visceral thorax,** which contains the respiratory passageway, lungs, and the mediastinum.
3. **Muscles of respiration,** which contain the diaphragm, accessory muscles of inspiration, accessory muscles of expiration, and muscles of postural control.

67. What are the three classes of ribs?

ANSWER: 1. **True** (vertebrosternal) ribs, which include the upper ribs (1-7), all of which are directly attached to the sternum.
2. **False** (vertebrochondral) ribs, which include ribs 8, 9, and 10, and are attached to the sternum through cartilage.
3. **Floating** (vertebral) ribs (ribs 11 and 12), which articulate only with the vertebral column.

68. What are the three morphological changes that occur in people with emphysema?

ANSWER: 1. The first morphological change affects the alveoli of the lungs. The walls of the alveoli break down, and clusters of alveoli become a single sac.
2. The second morphological change arises as a result of the first change. The person experiences an ongoing shortage of oxygen, must breathe deeper and deeper to accommodate, and thus develops a "barrel chest."

3. The third morphological change results in respiratory failure, which leaves the person susceptible to respiratory disorders such as pneumonia.

69. What it "dry" pleurisy?

ANSWER: **Pleurisy** is a disease characterized by inflammation of the pleural linings of the thoracic cavity. This inflammation can result in a condition called "**dry pleurisy**," which causes the client severe pain upon breathing. The cause of the pain is the loss of the lubricating quality of the intrapleural fluid. **Adhesions** may form that cause portions of the parietal pleurae to adhere to the visceral pleurae. Pleurisy may be unilateral or bilateral, and may cause excessive fluid (which is sometimes purulent) in the pleural space.

Match each term to the correct descriptor. Terms may be used more than once or not at all.

a. corpus sterni
b. manubrium sterni
c. xiphoid process
d. clavicle
e. scapula
f. thoracic vertebrae
g. cervical vertebrae
h. coccyx
i. sacrum

70. The superior-most structure of the sternum
ANSWER: b

71. The head of the first rib attaches to this structure
ANSWER: b

72. Forms the anterior-most attachment of the diaphragm
ANSWER: c

73. The inferior-most component of the vertebral column
ANSWER: h

74. Vertebrae that have an opening through which the vertebral artery passes
ANSWER: g

CHAPTER 2 - ANATOMY OF RESPIRATION

75. Forms the superior aspect of the pectoral girdle
ANSWER: d

Match each muscle to the correct descriptor. Terms may be used more than once or not at all.
a. pectoralis major
b. intraosseous portion, internal intercostals
c. pectoralis minor
d. sternocleidomastoid
e. scalenus anterior, medius, posterior
f. diaphragm
g. external intercostals

76. The primary muscle of inspiration
ANSWER: f

77. Arm muscle that attaches to the sternum and elevates the sternum during inspiration
ANSWER: a

78. Lies deep to the pectoralis major, originates on the coracoid process of the scapula, and elevates the rib cage
ANSWER: c

79. Responsible for turning the head, as well as elevating the thorax
ANSWER: d

80. Elevate each of the ribs during inspiration
ANSWER: g

Match each muscle to the correct descriptor. Terms may be used more than once or not at all.
a. rectus abdominis
b. transversus thoracis
c. transversus abdominis
d. external intercostals
e. internal intercostals
f. intraosseous portion, internal intercostals
g. intraosseous portion, external intercostals
h. internal oblique abdominis

81. Segmented muscle that runs from the xiphoid process to the pubic symphysis
ANSWER: a

82. Muscle of expiration that originates on the inguinal ligament and courses fanlike to insert into the linea semilunaris and lower margin of the rib cage
ANSWER: h

83. Elevates the rib cage

ANSWER: d

84. Pulls the ribs closer together as it depresses the rib cage
ANSWER: e

85. Courses from the thoracolumbar fascia to the linea semilunaris
ANSWER: b

Match each muscle to the correct descriptor. Terms may be used more than once or not at all.
a. rectus abdominis
b. transversus abdominis
c. transversus thoracis
d. internal oblique abdominis
e. internal intercostals
f. transversus thoracis
g. external intercostals
h. external oblique abdominis

86. Elevates the ribs
ANSWER: g

87. Deep to the rib cage; depresses the rib cage during expiration
ANSWER: f

88. Unilateral contraction of this muscle helps rotate the trunk in the direction of contraction
ANSWER: d

89. Originates on the inguinal ligament and linea semilunaris and courses fanlike to insert into the lower ribs
ANSWER: h

90. Contraction of this muscle brings the sternum closer to the pubic symphysis
ANSWER: a

Match each term to the correct descriptor. Terms may be used more than once or not at all.
a. inguinal ligament
b. xiphoid process
c. linea semilunaris
d. linea alba
e. thoracolumbar fascia

91. Component of the posterior attachment of the abdominal aponeurosis
ANSWER: e

92. Forms the insertion for the rectus abdominis
ANSWER: c

CHAPTER 2 - ANATOMY OF RESPIRATION

93. Forms the superior point of attachment for the rectus abdominis
ANSWER: b

94. Divides the left and right rectus abdominis muscles
ANSWER: d

95. Courses from the iliac crest to the pubic symphysis
ANSWER: a

Match each term to the correct descriptor. Terms may be used more than once or not at all.
a. transversus thoracis
b. serratus posterior inferior
c. serratus posterior superior
d. levator costarum longis
e. levator costarum brevis
f. rhomboideus major and minor
g. trapezius
h. latissimus dorsi

96. Muscle of the thorax that elevates the first four ribs
ANSWER: c

97. Muscle of the thorax that depresses the last four ribs
ANSWER: b

98. Arises from the transverse process of a thoracic vertebra and courses down to insert into the rib below
ANSWER: e

99. Arises from a thoracic vertebra and courses down. It skips the rib immediately below its vertebral origin and inserts into the rib below it
ANSWER: d

Match the indicated muscle or component to the correct function. Terms may be used more than once or not at all.
a. inspiration
b. expiration
c. neck stability
d. trunk stability

100. Sternocleidomastoid
ANSWER: a

101. External intercostal
ANSWER: a

102. Internal intercostal, intraosseous component
ANSWER: b

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103. Internal intercostal, interchondral component
ANSWER: a

104. Trapezius
ANSWER: c

105. Quadratus lumborum
ANSWER: d

106. Transversus thoracis
ANSWER: b

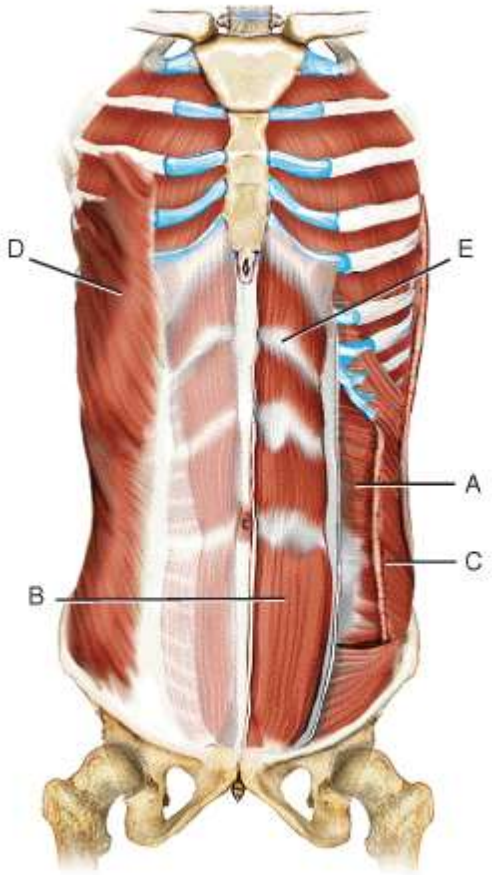
107. Pectoralis major
ANSWER: a

108. Scalenus anterior
ANSWER: c

109. Rhomboideus major and minor
ANSWER: d

Identify the muscles indicated on the following figure using the letters provided. Letters may be used more than once or not at all.

CHAPTER 2 - ANATOMY OF RESPIRATION



110. Rectus abdominis
ANSWER: b

111. Transversus abdominis
ANSWER: a

112. External oblique abdominis
ANSWER: d

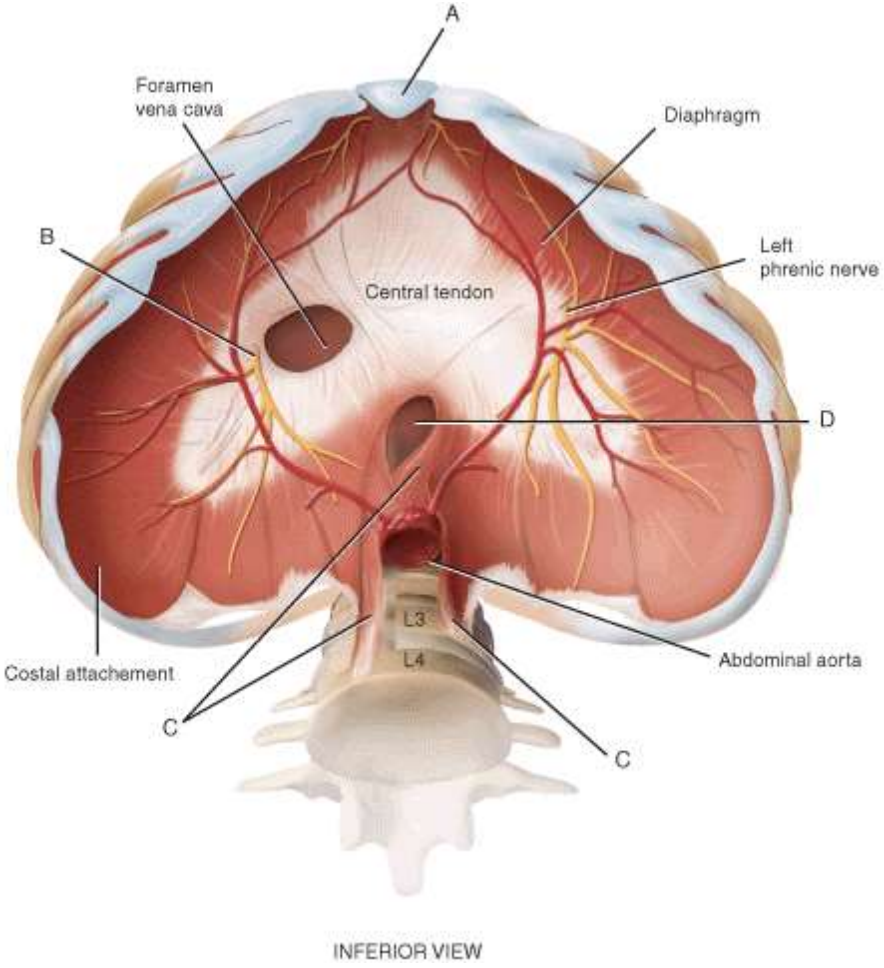
113. Internal oblique abdominis
ANSWER: c

114. Muscle that brings the pubic symphysis and the sternum closer together when it contracts.
ANSWER: b

Identify the components indicated on the following figure using the letters provided. Letters may be used more than once or not at all.

Name:_____ Class:_____ Date:_____

CHAPTER 2 - ANATOMY OF RESPIRATION



INFERIOR VIEW

115. Posterior-most attachment of the diaphragm
ANSWER: c

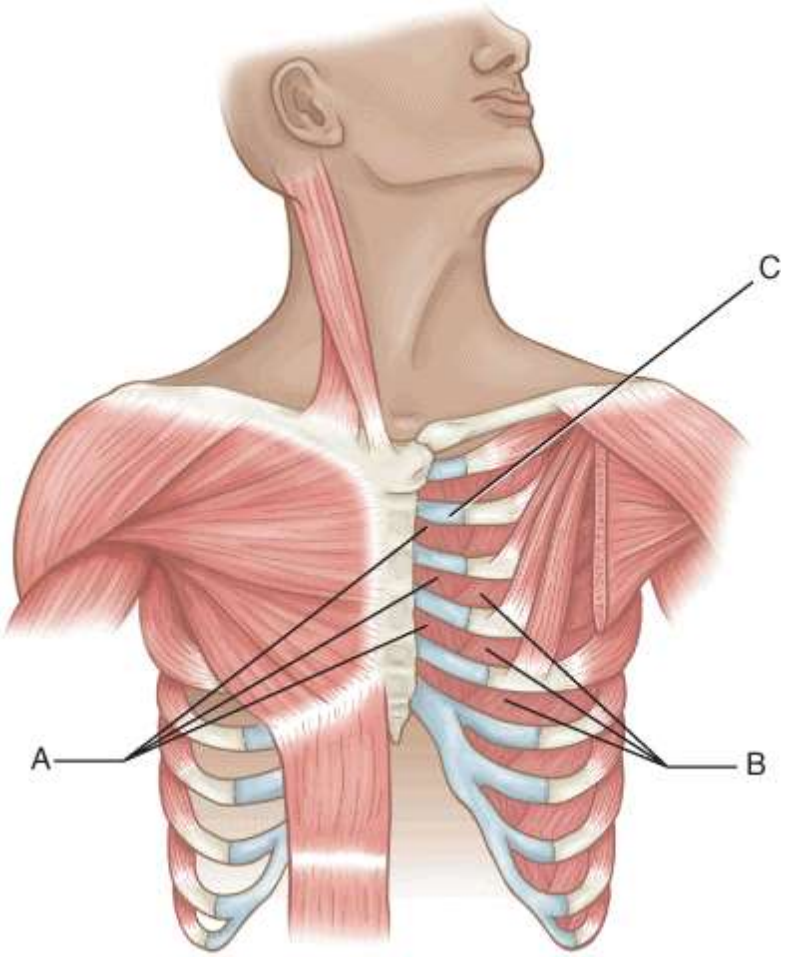
116. Sternal attachment of the diaphragm
ANSWER: a

117. The esophageal hiatus
ANSWER: d

118. Point of attachment arising from the L4 and L5 vertebrae
ANSWER: c

Identify the components indicated on the following figure using the letters provided. Letters may be used more than once or not at all.

CHAPTER 2 - ANATOMY OF RESPIRATION



119. A muscle of inspiration
ANSWER: b

120. Internal intercostal muscle
ANSWER: a

121. Chondral portion of the rib cage
ANSWER: c

122. External intercostal muscle
ANSWER: b