13 The Respiratory System

Study Guide 13-1

Body cells require an abundant and continuous supply of oxygen to carry out their activities. As cells use oxygen, they release carbon dioxide, a waste product that must be eliminated from the body. The circulatory and respiratory systems are intimately involved in obtaining and delivering oxygen to body cells and in eliminating carbon dioxide from the body. The respiratory system is responsible for gas exchange between the pulmonary blood and the external environment (that is, external respiration). The respiratory system also plays an important role in maintaining the acid-base balance of the blood.

Questions and activities in this chapter consider both the anatomy and physiology of the respiratory system structures.

FUNCTIONAL ANATOMY

1. The following questions refer to the primary bronchi. In the spaces provided, insert the letter *R* to indicate the right primary bronchus and the letter *L* to indicate the left primary bronchus.

1. Which of the primary bronchi is larger in diameter? _____
2. Which of the primary bronchi is more horizontal? _____
3. Which of the primary bronchi is the most common site for lodging of a foreign object that has entered the respiratory passageways? _____

2. Complete the following statements by inserting your answers in the answer blanks.

Air enters the nasal cavity of the respiratory system through the (1). The nasal cavity is divided by the midline (2). The nasal cavity mucosa has several functions. Its major functions are to (3), (4), and (5) the incoming air. Mucous membrane–lined cavities called (6) are found in several bones surrounding the nasal cavities. They make the skull less heavy and probably act as resonance chambers for (7). The passageway common to the digestive and respiratory systems, the (8), is often referred to as the throat; it connects the nasal cavity with the (9) below. Clusters of lymphatic tissue, (10), are part of the defensive system of the body. Reinforcement of the trachea with (11) rings prevents its collapse during (12) changes that occur during breathing. The fact that the rings are incomplete posteriorly allows a food bolus to bulge (13) during its transport to the stomach. The larynx or voice box is built from many cartilages, but the largest is the (14) cartilage. Within the larynx are the (15), which vibrate with exhaled air and allow an individual to (16).

_____ 1.
_____ 2.
_____ 3.
_____ 4.
_____ 5.
_____ 6.
_____ 7.
_____ 8.
_____ 9.
_____ 10.
_____ 11.
_____ 12.
_____ 13.
_____ 14.
_____ 15.
_____ 16.

4. Figure 13–1 is a sagittal view of the upper respiratory structures. First, correctly identify all structures provided with leader lines on the figure. Then select different colors for the structures listed below and use them to color in the coding circles and the corresponding structures on the figure.

- ◯ Nasal cavity
- ◯ Larynx
- ◯ Pharynx
- ◯ Paranasal sinuses
- ◯ Trachea

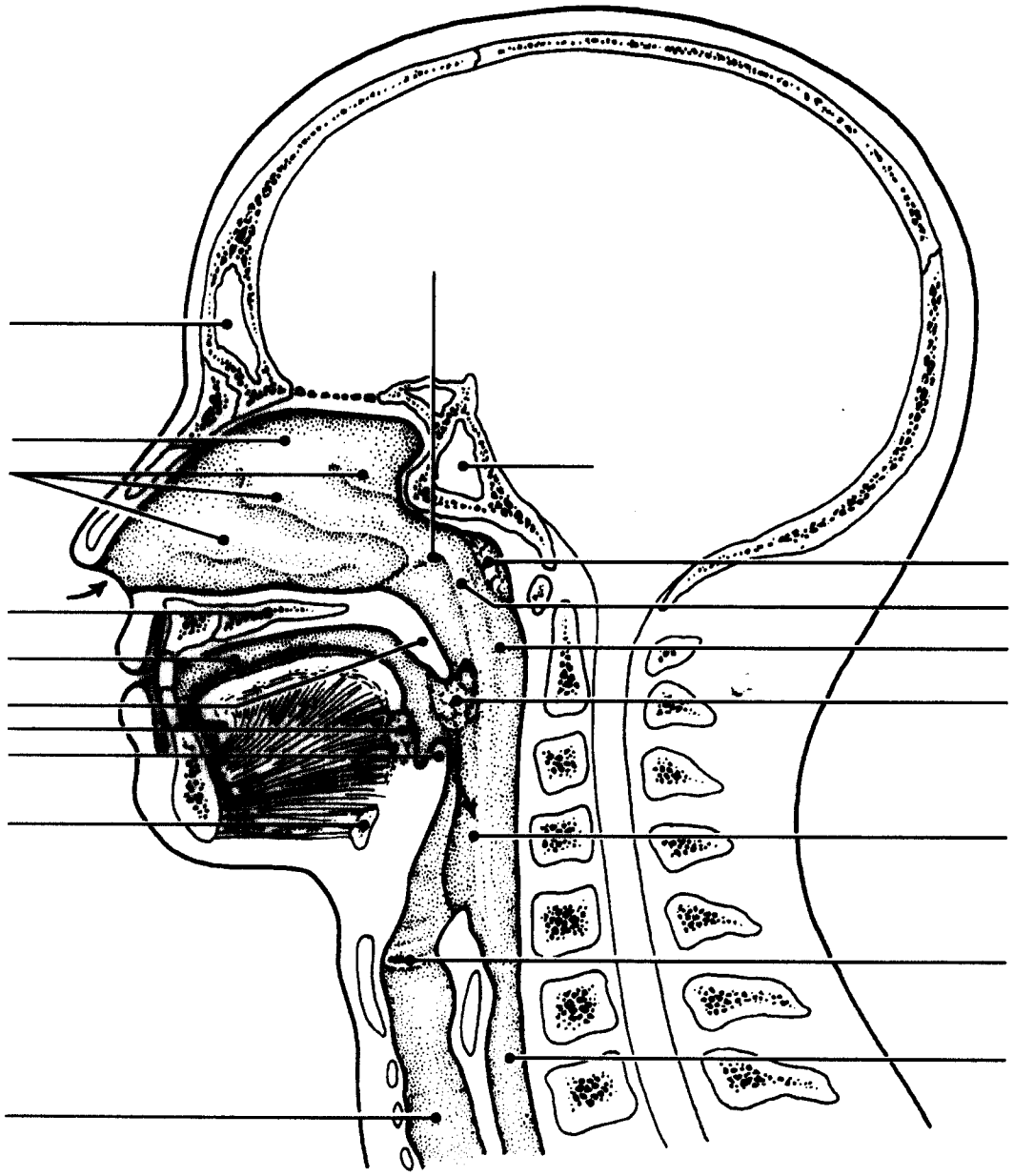

Figure 13–1

5. Using the key choices, select the terms identified in the following descriptions by inserting the appropriate term or letter in the answer blanks.

Key Choices

A. Alveoli	D. Epiglottis	G. Palate	J. Primary bronchi
B. Bronchioles	E. Esophagus	H. Parietal pleura	K. Trachea
C. Conchae	F. Glottis	I. Phrenic nerve	L. Visceral pleura

_____ 1. Smallest conducting respiratory passageways

_____ 2. Separates the oral and nasal cavities

_____ 3. Major nerve, stimulating the diaphragm

_____ 4. Food passageway posterior to the trachea

_____ 5. Closes off the larynx during swallowing

_____ 6. Windpipe

_____ 7. Actual site of gas exchanges

_____ 8. Pleural layer covering the thorax walls

_____ 9. Pleural layer covering the lungs

_____ 10. Lumen of larynx

_____ 11. Fleshy lobes in the nasal cavity which increase its surface area

6. Complete the following paragraph concerning the alveolar cells and their roles by writing the missing terms in the answer blanks.

_____ 1.
_____ 2.
_____ 3.
_____ 4.

With the exception of the stroma of the lungs, which is __(1)__ tissue, the lungs are mostly air spaces, of which the alveoli comprise the greatest part. The bulk of the alveolar walls are made up of squamous epithelial cells, which are well suited for their __(2)__ function. Much less numerous cuboidal cells produce a fluid that coats the air-exposed surface of the alveolus and contains a lipid-based molecule called __(3)__ that functions to __(4)__ of the alveolar fluid.