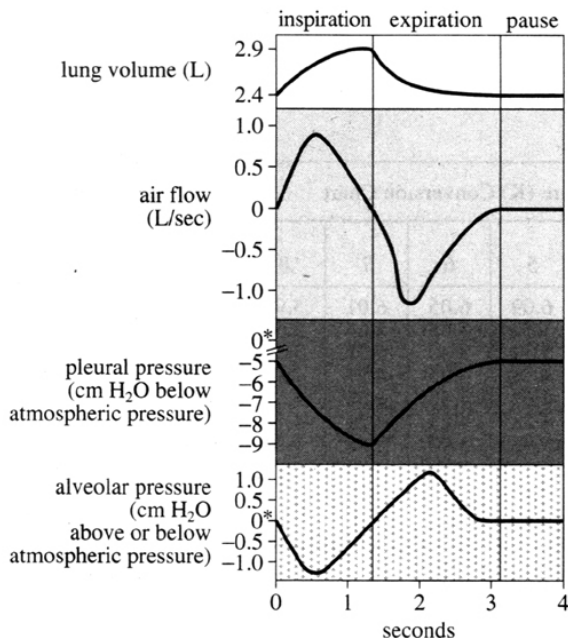


Passage IV

The respiratory cycle for resting humans who are breathing normally has been studied by physiologists. The figure shows 4 average measures of the cycle: *lung volume*, *air flow* (the rate at which air flows into or out of the lungs), *pleural pressure* (the pressure in the area between the lungs and the chest wall), and *alveolar pressure* (the pressure in the *alveoli*, small sacs in the lungs where air exchange takes place). Pleural pressure and alveolar pressure are represented as values above or below *atmospheric pressure* (1,033 cm H₂O). The next inspiration begins at the end of the pause.



*corresponds to atmospheric pressure (1,033 cm H₂O)

Figure adapted from Robert M. Berne and Matthew N. Levy, eds., *Principles of Physiology*. ©1990 by C. V. Mosby Company.

18. *Functional residual capacity* (FRC) refers to average lung volume during the pause portion of the respiratory cycle. Based on the figure, FRC is closest to which of the following values?
 - F. 0.5 L
 - G. 2.4 L
 - H. 2.9 L
 - J. 5.3 L
19. For a resting human who is breathing normally, how does the duration of inspiration compare with the duration of expiration?
 - A. The duration of inspiration is longer than the duration of expiration.
 - B. The duration of inspiration is shorter than the duration of expiration.
 - C. The duration of inspiration and the duration of expiration do not differ.
 - D. Cannot be determined from the given information
20. The figure shows that when pleural pressure is lowest, air flow is closest to which of the following?
 - F. -0.5 L/sec
 - G. 0 L/sec
 - H. 0.5 L/sec
 - J. 1.0 L/sec
21. When the diaphragm contracts during the first 0.5 sec of inspiration, the chest wall expands away from the lungs, which causes the lungs to expand. Based on the figure, what is the effect of the contraction of the diaphragm on pleural pressure and alveolar pressure?

	<u>pleural pressure</u>	<u>alveolar pressure</u>
A.	increases	increases
B.	increases	decreases
C.	decreases	increases
D.	decreases	decreases
22. According to the information provided, which of the following statements best describes the relationship between alveolar pressure, atmospheric pressure, and the direction of air flow during most of expiration?
 - F. Because alveolar pressure is less than atmospheric pressure during most of expiration, air flows into the lungs.
 - G. Because alveolar pressure is less than atmospheric pressure during most of expiration, air flows out of the lungs.
 - H. Because alveolar pressure exceeds atmospheric pressure during most of expiration, air flows into the lungs.
 - J. Because alveolar pressure exceeds atmospheric pressure during most of expiration, air flows out of the lungs.