



Scientific team

## Physiology-RS Quizz

1. The tidal volume is:

- A. The amount of air that normally moves into (or out of) the lungs with each respiration.
- B. The amount of air that enters the lungs but does not participate in gas exchange.
- C. The amount of air expired after maximal expiratory effort.
- D. The amount of gas that can be moved into and out of the lungs in 1 minute.
- E. None of the above.

Answer: A

2. Which of the following conditions are reasonable explanations for a patient's decreased static pulmonary compliance (the pressure-volume curve for the lungs shifted to the right)?

- A. Decreased functional pulmonary surfactant.
- B. Fibrosis of the lungs.
- C. Surgical removal of one lobe.
- D. Pulmonary vascular congestion.
- E. All of the above.

Answer: E

3. Which of the following statements concerning pulmonary mechanics during the early portion of a forced expiration, when lung volume is still high, is/are correct?

- A. There is less alveolar elastic recoil at high lung volumes than there is at low lung volumes.
- B. Airways resistance is greater at high lung volumes than it is at low lung volumes.
- C. There is more dynamic compression of airways at high lung volumes than there is at low lung volumes.
- D. The effective pressure gradient for airflow is greater at high lung volumes than it is at low lung volumes.

Answer: D

4. Residual volume to lung capacity ratio:

- A. Is increased in emphysema due to air trapping.
- B. Is decreased in restrictive lung diseases due to decreases in total lung capacity.
- C. Can be determined during spirometry.
- D. Is normally around 40%.
- E. None of the above.

Answer: A

5. The volume of air which is exhaled forceful after forceful inhalation during the dynamic spirometry test equal to

- A. Functional residual capacity.
- B. Forced vital capacity.
- C. Total lung capacity.
- D. Inspiratory capacity.
- E. Expiratory Capacity.

Answer: B

6. Air trapping in obstructive lung disease will cause an increase in which of the following lung volumes or capacities

- A. Functional residual capacity.
- B. Forced Vital capacity.
- C. Total lung capacity.
- D. Inspiratory capacity.
- E. Expiratory Capacity.

Answer: A



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7. During tidal breathing, which cause air flow into the lung is caused by

- A. Increase lung elastic recoil pressure.
- B. Decreased lung elastic recoil pressure.
- C. Increase intralveolar pressure.
- D. Increase transalveolar pressure.
- E. Decreased atmospheric pressure.

Answer: D

8. Which of the following conditions are reasonable explanations for a patient's decreased static pulmonary compliance (the pressure-volume curve for the lungs shifted to the right)?

- A. Decreased functional pulmonary surfactant.
- B. Fibrosis of the lungs.
- C. Surgical removal of one lobe.
- D. Pulmonary vascular congestion.
- E. All of the above.

Answer: E

9. A woman inspires 500 mL from a spirometer. The intrapleural pressure, determined using an esophageal balloon, was  $-5$  cm H<sub>2</sub>O before the inspiratory effort and  $-10$  cm H<sub>2</sub>O at the end of the inspiration. Her lung compliance per one unit change in transpulmonary pressure is

- A. 50ml.
- B. 100 ml.
- C. 200 ml.
- D. 400 ml.
- E. 500 ml.

Answer: B

10. Dynamic pressure of the airways occurs

- A. When the alveolar pressure exceeds atmospheric pressure.
- B. When the intrapleural pressure exceeds the inside pressure of the airways.
- C. During normal tidal expiration.
- D. When the lung volume is at FRC.
- E. During forceful inspiration.

Answer: B

11. What is the  $P_{O_2}$  (in mm Hg) of moist inspired gas of a climber on the summit of Mt. Everest (assume barometric pressure is 247 mm Hg)? Assuming that water vapor pressure is 47 mm Hg and the fractional concentration of  $O_2$  is 21%

- A. 32.
- B. 42.
- C. 52.
- D. 62.
- E. 72.

Answer: B

12. A 65-year-old man complained of worsening dyspnea on exertion over a 6-month period. A lung biopsy was done because of changes seen on chest imaging. The pathology report states that the thickness of the thin side of the blood-gas barrier is greater than 0.8  $\mu$ m in most of the alveoli. Which of the following would you expect?

- A. Decreased rate of diffusion of oxygen into the pulmonary capillaries.
- B. Increase in volume of individual red cells.
- C. Increased risk of rupture of the blood-gas barrier.
- D. Slower diffusion of gas from the distal airways to the alveoli.
- E. Increased airway smooth muscle contraction.

Answer: A