Pre-Class Preparation for "The Silent Killer: An Exploration of the Oxygen-Hemoglobin Dissociation Curve"

by
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Note Catcher

Watch the following video:

- Zach, Murphy. "Respiratory Oxygen-Hemoglobin Dissociation Curve." Youtube, Ninja Nerd. 27 June 2017. https://youtu.be/bhJarMGNFw4

Pause the video after each of the indicated time stamps below and answer the following questions.

Time Stamp 0:00–1:27

1. On the oxygen-hemoglobin dissociation the curve the:
   y-axis represents the _____ of hemoglobin or the percentage of oxygen bound to hemoglobin.
   x-axis represents the _____ in mmHg.

Time Stamp 1:27–2:09

2. The oxygen-hemoglobin dissociation curve displays an s-shape, also known as a _____ curve.

Time Stamp 2:09–2:57

3. At the plateau phase, how does an increase in the partial pressure impact the oxygen saturation of hemoglobin?
   A. The hemoglobin saturation gradually decreases.
   B. The hemoglobin saturation exponentially decreases.
   C. The hemoglobin saturation exponentially increases.
   D. The hemoglobin saturation does not change or only increases minimally.

4. The plateau phase corresponds with a partial pressure of oxygen of approximately 60 mmHg and _____ mmHg.

5. From a partial pressure of oxygen at approximately 50 mmHg downward, as the partial pressure of oxygen decreases the percent saturation of hemoglobin
   A. slightly decreases.
   B. significantly decreases.
   C. slightly increases.
   D. significantly increases.

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Time Stamp 2:57–4:55

6. The alveoli lungs and pulmonary capillaries have a partial pressure of oxygen of approximately _____mmHg and the hemoglobin is ___% saturated with oxygen.

Time Stamp 4:55–7:27

7. Resting systemic tissues generally have a partial pressure of oxygen near ___ mmHg.

8. After gas exchange occurs in the systemic tissues occurs, the venous blood has a hemoglobin oxygen saturation of approximately ___%.

Time Stamp 7:28–10:46

9. The blood entering the peripheral systemic capillary beds has a hemoglobin oxygen percent saturation of ___%.

10. In the peripheral systemic capillaries, the hemoglobin releases oxygen and picks up carbon dioxide, resulting in blood leaving the capillaries with hemoglobin oxygen saturation of ___%. This means ___% of the oxygen was unloaded to the (resting) tissues.

Time Stamp 10:47–12:41

11. Increased metabolic activity results in increased carbon dioxide, protons (H+), 2, 3 BPG, and temperature _____(strengthening/weakening) the bond between hemoglobin and oxygen.

Time Stamp 12:42–12:41

12. Increased metabolic activity results in increased carbon dioxide, protons (H+), 2,3 BPG, and temperature _____(strengthening/weakening) the bond between hemoglobin and oxygen.

Time Stamp 12:41–16:10

13. At a partial pressure of oxygen of approximately 20 mmHg the oxygen saturation of hemoglobin will be approximately ___% resulting in ___% oxygen unloading.

Time Stamp 16:10–20:43

14. A Bohr effect causes a _____ (left/right) shift in the oxygen-hemoglobin dissociation curve. This _____ (decreases/increases) hemoglobin's affinity for oxygen and _____ (decreases/increases) oxygen dissociation.

Time Stamp 16:10–23:53

15. A left shift or _____ effect occurs in the presence of _____ (high/low) carbon dioxide, _____ (high/low) protons, _____ (high/low) 2,3 BPG, _____ (high/low) temperature, and _____ (high/low) oxygen, _____ (decreasing/increasing) hemoglobin's affinity for oxygen and _____ (decreasing/increasing) oxygen unloading.