Instructor's Response(s) to Discussion Question(s) - Module 13

Describe/discuss/explain how a disease condition that thickens the tissue barrier between the alveolar space and pulmonary capillary blood might affect the mechanism(s) by which oxygen is transported in the blood between the pulmonary capillaries and the tissue capillaries. Work individually; **post your response by 6:00 PM on Day 4 of the Module.**

A thicker (than normal) tissue barrier between the alveolar space and pulmonary capillary blood will reduce the amount of oxygen that diffuses from alveolar air into pulmonary capillary blood in a given time - see B&L[6+], pp 459 - 460 and Figures 23-2, 23-3; B&L[7], pp 480 - 481 and Figures 24.2 and 24.3; VSL[14], pp 460 - 461 and Figure 13-23; West[10], chapter 3. However, note that, depending on the increase in thickness of the tissue barrier[1], pulmonary capillary pO_2 may not be compromised.

However, the mechanisms by which oxygen is transported in the blood between the pulmonary capillaries and the tissue capillaries will not be affected (by a thicker than normal tissue barrier between the alveolar space and pulmonary capillary blood). As noted in West[10], on page 88, "O_2 is carried in the blood in two forms: dissolved and combined with hemoglobin." These mechanisms are explained in section 13.4 in VSL[14] and on pages 461 - 464 in B&L[6+] and on pages 482 - 485 in B&L[7]; they are not affected by the amount of oxygen delivered to the pulmonary capillary blood.

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[1] If the increase in thickness is "small" pulmonary capillary pO_2 may equilibrate with alveolar pO_2 even if the rate of O_2 transfer from alveoli to pulmonary capillary blood is reduced - see VSL[14], Figure 13-23 and/or West[10], Figures 3.2 and 3.3 and their associated text.

Rev 0, 4/6/17 - adapted from Spring 16, Rev 1 with minor text updates to the wording of the question.
Rev 1, 11/23/17 - update refs to include B&L[7]
Rev 2, 7/16/18 - update to 601; no content changes
Rev 3, 11/8/19 - change time due to 9:00 PM