# review sheet results essay sample

1. List the hematocrits for the healthy male (sample 1) and female (sample 2) living in Boston (at sea level) and indicate whether they are normal or whether they indicate anemia or polycythemia. 1. The hematocrit value for the healthy male: 48

2. The hematocrit value for the healthy female: 44

Both values are normal because they are between the normal ranges: for males between 42-52% and for females between 42-47%. 2. Describe the difference between the hematocrits for the male and female living in Boston. Why does this difference between the sexes exist? The difference in the hematocrits level is perfectly normal because males usually have higher hematocrit levels than females. This is due to higher testosterone levels that males have.

Among other characteristics, testosterone is responsible for stimulating the release of erythropoetin (EPO) from the kidneys, and EPO is a hormone responsible for stimulating the synthesis of RBCs. By having higher levels of testosterone leads to more EPO secretion resulting in higher hematocrit levels. 3. List the hematocrits for the healthy male and female living in Denver (approximately one mile above sea level) and indicate whether they are normal or whether they indicate anemia or polycythemia. 1. The hematocrit value for the healthy male: 55.

2. The hematocrit value for the healthy female: 53.

The average hematocrit levels for a male are between: 42-52% and for females between 37-47%. The values for the male and female living in Denver are higher-than-normal, indicating that they have polycythemia.

4. How did the hematocrit levels of the Denver residents differ from those of the Boston residents? Why? How well did the results compare with your prediction? My prediction matched the results. The Denver residents have higher-than-normal hematocrit levels vs. the Boston residents, because the Denver residents live at higher altitude than those from Boston. At higher elevation the concentration of oxygen is lower. The body adapts therefore more RBCs are needed to transport oxygen.

5. Describe how the kidneys respond to a chronic decrease in oxygen and what effect this has on hematocrit levels. If the blood that is being filtered by the kidney has a chronic decrease in oxygen, in turn the kidneys respond by releasing more erythropoietin (EPO). EPO is a hormone responsible for stimulating the synthesis of RBCs in the bone marrow. As a result there will be a higher than normal hematocrit level.

6. List the hematocrit for the male with aplastic anemia (sample 5) and indicate whether it is normal or abnormal. Explain your response. The hematocrit for the male with aplastic anemia (sample 5): 19. The hematocrit level is abnormal (very low) because the average hematocrit levels for a male are between: 42-52%.

7. List the hematocrit for the female with iron-deficiency anemia (sample 6) and indicate whether it is normal or abnormal. Explain your response. The hematocrit for the female with iron-deficiency anemia (sample 6): 32. The hematocrit level is abnormal (lower) because the average hematocrit range for females is between 37- 47%.

Review Sheet Results (2)

1. Describe the effect that sickle cell anemia has on the sedimentation rate (sample 3). Why do you think that it has this effect? By comparing the results of a the healthy individual (sample 1) with the individual that has sickle cell anemia, the erythrocyte sedimentation rate (ESR) for sample 1 was 5mm/hr vs. sample 3 which was 0mm/hr. Based on this we can conclude that sickle cell anemia has no effect on ESR. This is caused by the protein portion of the hemoglobin molecules that fold incorrectly when oxygen levels are low, resulting in the sickle shape of the RBCs. The oxygen molecules cannot bind to the sickle shaped RBCs.

2. How did the sedimentation rate for the menstruating female (sample 2) compare with the sedimentation rate for the healthy individual (sample 1)? Why do you think this occurs? The ESR for sample 2 was 15mm/hr and for sample 1 was 5mm/hr. The menstruating female has an increase in ESR due to anemia.

3. How did the sedimentation rate for the individual with angina pectoris (sample 6) compare with the sedimentation rate for the healthy individual (sample 1)? Why? How well did the results compare with your prediction? My prediction did not match the results. In both cases (sample 1 and 6) the ESR was 5mm/hr. ESR is normal in angina pectoris without myocardial infarction.

4. What effect does iron-deficiency anemia (sample 4) have on the sedimentation rate? The ESR in sample 4 was 30 mm/hr – iron-deficiency anemia has a significative influence on ESR by elevating the levels.

5. Compare the sedimentation rate for the individual suffering a myocardial infarction (sample 5) with the sedimentation rate for the individual with angina pectoris (sample 6). Explain how you might use this data to monitor heart conditions. ESR for sample 5 was 40 mm/hr vs. sample 6 which was 5mm/hr. This data can be used to tell if a patient's chest pains are actually a heart attack or chest pain without myocardial infarction.

Review Sheet Results (3)

1. Is the male with polycythemia (sample 4) deficient in hemoglobin? Why? The male with polycythemia is not deficient in Hb. The Hb levels for a healthy male are between 13. 5-18 g/100ml. The male in sample 4 has an increased levels of Hb (20 g/100ml).

2. How did the hemoglobin levels for the female Olympic athlete (sample 5) compare with the hemoglobin levels for the healthy female (sample 2)? Is either person deficient in hemoglobin? How well did the results compare with your prediction? The results matched my prediction. Hb levels for sample 5 were 22 g/100ml vs. sample 2 that had Hb levels of 14 g/100ml. The female Olympic athlete is not deficient in Hb. Her Hb levels are above the normal-than-average range.

3. List conditions in which hemoglobin levels would be expected to decrease. Provide reasons for the change when possible. Hb levels are expected to decrease in patients with anemia, hyperthyroidism, and cirrhosis of the liver, renal disease, systemic Lupus erythematosus and severe hemorrhage.

4. List conditions in which hemoglobin levels would be expected to increase. Provide reasons for the change when possible. Hb levels increase in patients with polycythemia, congestive heart failure, COPD, living at high altitudes.

5. Describe the ratio of hematocrit to hemoglobin for the healthy male (sample 1) and female (sample 2). (A normal ratio of hematocrit to grams of hemoglobin is approximately 3: 1.) Discuss any differences between the two individuals. Sample 1 had a ratio of 3: 1 and sample 2 had a ratio of 3. 14: 1. The ratio for sample 2 is slightly higher than that from the sample 1, but both are normal.

6. Describe the ratio of hematocrit to hemoglobin for the female with iron-deficiency anemia (sample 3) and the female Olympic athlete (sample 5). (A normal ratio of hematocrit to grams of hemoglobin is approximately 3: 1.) Discuss any differences between the two individuals. Sample 3 had a hematocrit to Hb ratio 5: 1 and sample 5 had a ratio of 2. 73: 1. The female in sample is deficient in Hb resulting in a ratio different from a normal ratio of 3: 1. The female in sample 5 has a ratio close to normal because she is not deficient in Hb.

Review Sheet Results (4)

1. How did the appearance of the A, B, and Rh samples for the patient with AB- blood type compare with your prediction? My prediction matched the results because A was clumped, B was clumped but Rh was not (it was smooth).

2. Which blood sample contained the rarest blood type?

AB- (sample 3).

3. Which blood sample contained the universal donor?

That would be type O- (Sample 4).

4. Which blood sample contained the universal recipient?

Sample no. 5 (AB+).

5. Which blood sample did not agglutinate with any of the antibodies tested? Why? Sample 4 did not agglutinate with any of the antibodies tested. This is because none of the antigens were present.

6. What antibodies would be found in the plasma of blood sample 1?

Anti-B antibody.

7. When transfusing an individual with blood that is compatible but not the same type, it is important to separate packed cells from the plasma and administer only the packed cells. Why do you think this is done? (Hint: think about what is in plasma versus what is on RBCs.) The plasma contains the antibodies that could react with the recipient's antigens on RBCs.

8. List the blood samples in this activity that represents people who could donate blood to a person with type B+ blood. Blood samples: B+ (sample 2), B- (sample 6), O- (sample 4).

Review Sheet Results (5)

1. Which patient(s) had desirable cholesterol level(s)?

Patient 1 and 3.

2. Which patient(s) had elevated cholesterol level(s)?

Patient 2. Patient 4 was borderline elevated.

3. Describe the risks for the patient(s) you identified in question 2. Risks of

cardiovascular disease.

4. Was the cholesterol level for patient 4 low, desirable, or high? How well did the results compare with your prediction? What advice about diet and exercise would you give to this patient? Why? Patient 4 was borderline high. The results almost matched my prediction. My advice to the patient would be to reduce the amount of fat (especially saturated), eat more vegetables, grill the meat or boil it, do more exercise. If the patient continues with his present lifestyle, is going to develop in the near future cardiovascular problems. 5. Describe some reasons why a patient might have abnormally low blood cholesterol. Possible causes for low blood cholesterol: hyperthyroidism, liver disease, inadequate absorption of nutrients from the intestine, or malnutrition.