

**Blood Take Home Quiz –**

**Answers must be HANDWRITTEN, no big words (other than those discussed in class) and your own words (you fail if you copy or are copied from).**

- 1. Patients with advanced kidney diseases that impair kidney function often become anemic. Patients with kidney tumors sometimes develop polycythemia. Explain these symptoms. (HINT – tumors often cause overactivity of affected tissue).**
- 2. What is the rationale for athletes training in high altitude settings? (In other words – what might the advantage of high altitude training be?)**
- 3. An Rh-positive baby is suffering from erythroblastosis fetalis. An exchange transfusion is performed, in which some of the baby's blood is removed and replaced with blood from a donor. Why is the transfusion necessary? Why would the chosen donor's blood be Rh-negative?**
- 4. Pretend you are a doctor for this question. You have two sick patients and draw blood on both. Patient A's blood sample shows granulocytosis while patient B's blood sample shows lymphocytosis. Define both of the underlined terms (what disorders do these terms indicate). Which patient will you prescribe antibiotics to? Explain.**
- 5. Jack is blood type A-, Jill is blood type O+. Can Jill get Jack's blood (explain). Can Jack get Jill's blood (explain). Jack and Jill are married (duh) and decide to start a family. Consider the most likely genotypes for Jack and Jill and explain the blood type their first child is most likely to have. Can they have a child with a “- “ blood type? What are the chances of this occurring?**

## Case Study

Dolores Welborn is a 28-year-old attorney living in Portland, Oregon. Dolores is in the second trimester of pregnancy with her first child, and though her pregnancy had been progressing normally, recently she has noticed that she tires very easily and is short of breath from even the slightest exertion. She also has experienced periods of light-headedness, though not to the point of fainting. Other changes she has noticed are cramping in her legs, a desire to crunch on ice, and the fact that her tongue is sore. She doubts that all of these symptoms are related to one another, but she is concerned, and she makes an appointment to see her physician.

Upon examining Dolores, her physician finds that she has tachycardia, pale gums and nail beds, and her tongue is swollen. Given her history and the findings on her physical exam, the physician suspects that Dolores is anemic and orders a sample of her blood for examination. The results are shown below:

Table 1. Blood Sample Results

Red Blood Cell Count	3.5 million/mm <sup>3</sup>
Hemoglobin (Hb)	7 g/dl
Hematocrit (Hct)	30%
Serum Iron	low
Mean Corpuscular Volume (MCV)	low
Mean Corpuscular Hb Concentration (MCHC)	low
Total Iron Binding Capacity in the Blood (TIBC)	high

A diagnosis of anemia due to iron deficiency is made and oral iron supplements prescribed. Dolores' symptoms are eliminated within a couple of weeks and the remainder of her pregnancy progresses without difficulty.

## Questions

1. Describe the structure of a molecule of hemoglobin and explain the role played by iron in the transport of oxygen.
2. How is iron stored and transported in the body?
3. What is Iron Deficiency Anemia (IDA) and how frequently does it occur?
4. What are the most common causes of IDA?
5. Why are women more prone to IDA than men?
6. What are the red blood cell indices, and what tests are diagnostic for IDA?

7. How is IDA treated and prevented.

