PATHOLOGY OF ANEMIA I

Date:  Tuesday, November 6, 2018, 9:30 AM

Reading Assignment: Robbins Basic Pathology, 10th edition, Chapter #12 on “Hematopoietic and lymphoid systems”, Section on “Red cell disorders”

LECTURE OBJECTIVES

1. Define hematopoiesis and outline the normal development of blood cells.
2. Discuss the importance of the peripheral blood smear, and how the smear is interpreted.
3. Describe the shape of the mature red blood cell.
4. Describe the red blood cell membrane, including the importance of integral proteins and the membrane cytoskeleton.
5. Name the 2 biosynthetic pathways involved in hemoglobin synthesis.
6. Briefly discuss red blood cell catabolism.
7. Define anemia.
8. Describe the basis for the classification of anemias and give examples of each mechanism for anemia.
9. Describe the various red blood cell indices, and classify anemia based on mean cell volume (MCV).
10. Describe intravascular and extravascular hemolysis.
11. Describe why the spleen plays a critical role in the destruction of spherocytes in hereditary spherocytosis. Explain why the red blood cells are spheroidal in this disorder and describe clinical findings (including heredity), course of disease, and treatment.
12. Explain why glucose 6-phosphate dehydrogenase deficiency reduces the ability of the red cell to protect itself from oxidative injury and why oxidative injury may result in hemolysis. Under what circumstances do patients with G-6-PD deficiency have hemolysis? Describe the clinical findings.
13. Explain how Heinz bodies are formed and describe their significance in hemolysis.
14. Name the critical amino acid substitution producing hemoglobin S and describe what happens to hemoglobin S upon deoxygenation.

15. Describe the major consequences stemming from the sickling of red cells in sickle cell anemia and the resulting clinical signs and symptoms.