Lecture 5 – RBC Counting & Indices (Laboratory Methods for RBCs)

OBJECTIVES

1. List the anticoagulant used for collection of blood specimens for routine hematology tests and describe general handling and processing requirements.

2. State the dimensions of the counting area of a Neubauer ruled hemocytometer.

3. Describe the performance of manual cell counts for white blood cells, red blood cells, and platelets, including types of diluting fluids, typical dilutions, and typical areas counted in the hemocytometer.

4. Calculate dilutions for cell counts when given appropriate data.

5. Calculate hemacytometer cell counts when given numbers of cells, area counted, and dilution.

6. Correct white blood cell counts for the presence of nucleated red blood cells.

7. Describe the principle of the cyanmethemoglobin assay for determination of hemoglobin.

8. Calculate the values for a standard curve for cyanmethemoglobin determination when given the appropriate data, describe how the standard curve is constructed, and use the standard curve to determine hemoglobin values.

9. Describe the procedure for performing a microhematocrit.

10. Identify sources of error in routine manual procedures discussed in this chapter and recognize written scenarios describing such errors.

11. Compare red blood cell count, hemoglobin, and hematocrit values using the rule of three.

12. Calculate red blood cell indices (mean cell volume, mean cell hemoglobin, and mean cell hemoglobin concentration) when given appropriate data, and interpret the results relative to the volume and hemoglobin content and concentration in the red blood cells.

13. Describe the principle and procedure for performing a manual reticulocyte count and the clinical value of the test.

14. Given the appropriate data, calculate the relative, absolute, and corrected reticulocyte counts and the reticulocyte production index; interpret results to determine the adequacy of the bone marrow erythropoietic response in an anemia.

15. Describe the procedure for performing the Westergren erythrocyte sedimentation rate and state its clinical utility.

16. Describe the aspects of establishing a point-of-care testing program, including quality management and selection of instrumentation.

17. Discuss the advantages and disadvantages of point-of-care testing as they apply to hematology tests.

18. Describe the principles of common instruments used for point-of-care testing for hemoglobin level, hematocrit, white blood cell counts, and platelet counts.