MEDICAL LABORATORY TECHNOLOGY
MLAB 2431 IMMUNOHEMATOLOGY

Instructional Objectives and Course Outline

INSTRUCTIONAL OBJECTIVES

1. Describe the "ideal" setting and personnel in a blood donation center.

2. Describe the differences between blood bank (transfusion service) and a blood center.

3. Describe the Standards and governing bodies involved in the regulation of blood banks and blood centers.

4. State the purposes of the physical exam and medical history.

5. State the 2 purposes for careful screening of potential donors

6. State the period of time that donor records must be kept.

7. Describe the basic information which must be obtained during the registration of the donor.

8. Describe the educational materials which must be presented to the potential donor.

9. State the frequency of donation for whole blood and hemapheresis.

10. Given a donor’s medical interview results determine whether or not the donor is eligible to donate and if the donor is not eligible, state the length of the deferral.

11. State the deferral times for blood borne diseases such as hepatitis, malaria, babesiosis, and Chagas disease.

12. State the signs and symptoms of AIDS and activities which may put a person at risk.

COURSE OUTLINE

I. Blood Collection
   A. Donors Screening
   B. Blood Bank versus Blood Center
   C. Standards, Regulations, and Governing Bodies
   D. Donor Screening
   E. Registration of the Donor
   F. Medical History
13. Describe the reason for permanent deferral of person receiving pit-hGH.

14. State the protozoan diseases transmitted by blood transfusion and donor deferral time.

15. State the deferral time for the vaccinations and immunizations.

16. List three medications which may result in deferral of a donor and the time period of the deferral.

17. State the sexually transmitted diseases which will cause deferral of the donor, reason and length of time of deferral.

18. State the criteria and acceptable results of all tests performed during the physical.

19. Given a donor’s physical results determine whether or not the donor is eligible to donate and, if the donor is not eligible state, the length of the deferral.

20. Describe the method used to allow the donor to perform the confidential self exclusion and how this improves the safety of the blood supply.

21. List three terms used to describe blood donated by and individual which can be used for anyone.

22. Define and state the purpose for the following types of donations: therapeutic, autologous, recipient specific, and directed donors.

23. Define “hemapheresis”.

24. Describe the collection and use of stem cells.

25. Discuss the materials and supplies used for the proper collection of donor blood.

26. Describe the donor identification process.

27. Delineate the proper steps in the preparation of the donor venipuncture site and the collection of blood.

28. List 7 donor reactions which may occur, during the donation process, including the possible cause and appropriate treatment for each.
29. Discuss the procedures and instructions provided to the donor after donation.

L. Care of the Donor After Phlebotomy

30. List 7 tests which must be performed on each unit of donor blood to prevent disease transmission.

M. Processing Donor Blood

31. List 3 optional tests which may be performed on donor blood and reason for performing.

32. Describe the information which must appear on the label of each donor unit.

33. List the serological tests which must be confirmed by the transfusion service.

34. State the storage temperature and length of time which donor samples must be saved by the transfusion service.

II. Blood and Blood Components

35. State the goals of blood collection, preparation and storage as related to viability, physical changes and bacterial contamination.

A. Goals of Blood Collection, Preparation and Storage

B. Anticoagulants and Preservative Solutions

36. List 2 anticoagulants which are routinely used for collection of donated blood and state the maximum acceptable storage time.

37. Describe the ADSOL blood collection system including expiration time.

38. State the expiration time for heparin.

39. Define "shelf life".

40. Briefly describe the methods used to prepare components from a unit of whole blood including the time within which the processing must occur.

41. State the expiration time for a unit of blood in which the hermetic seal has been broken.
42. List 5 blood components which are routinely prepared from a single unit of whole blood.

43. State the purpose for separating blood into its’ specific components.

44. Describe 5 transfusion practices which must be adhered to for safe transfusion of blood & blood components.

45. For each of the following components state the appropriate expiration date, storage temperature, preparation, use and special considerations:
   - Whole Blood
   - Leukocyte Reduced RBCs
   - Red Blood Cells
   - Red Blood Cells Frozen
   - Washed RBCs
   - Platelets - Random Donor
   - Rejuvenated Blood
   - Granulocytes
   - Platelets - Pheresis
   - Irradiated Components

46. For each the following components state the appropriate expiration date, storage temperature, preparation, use and special considerations:
   - Fresh Frozen Plasma
   - Liquid or Recovered Plasma
   - Solvent Detergent Plasma
   - Cryoprecipitate

47. State the purpose for irradiation of blood components in the prevention of “graft versus host” disease.

48. Define “graft versus host” disease.

49. List three patient populations who may be candidates for irradiated blood components

50. List 5 conditions/observations which may indicate that a unit is unfit for transfusion.

51. Briefly explain the testing which must be performed to determine whether a unit is bacterially contaminated.

52. List 3 ways in which a unit may become contaminated with bacteria.
53. List the 5 acceptable criteria which must be met before reissuing blood which has been returned.

54. State the proper conditions which must met to transport blood and/or blood components between facilities.

55. Describe the type of information which must be part of each component preparation record.

III. Immunology Review

56. List and describe the 3 functions of the Immunologic response.

57. Compare and contrast “pluripotential” and “committed” stem cell.

58. State the 2 cells lines which are produced once a stem cell is “committed”.

59. Compare and contrast the role of monocytes and tissue macrophages.

60. List and describe the 3 different types of T cells and state the function of each.

61. Describe the role of the B cell in the immune response.

62. Compare and contrast the “innate” immune response with the “adaptive” immune response.

63. List 5 physical and physiological factors which are part of the innate immune system.

64. Describe the process of “inflammation” including the 4 symptoms that may be exhibited.

65. Define “antigen”.

66. List 3 physical criteria which characterize a “good” antigen.

67. Compare “responder” and “non-responder” as it relates to the immune system.

68. Describe the importance of route of administration and dose in ensuring an immune response will occur.

69. Define the term “antigenic determinants”.

J. Transportation of Blood and Blood Components

K. Records

A. Function of the Immunologic Response

B. Components of the Immune System

C. Immune Response

D. Antigens
70. Describe the chemical structure of blood group antigens

71. Define "hapten"

72. Describe in detail the cellular immune response. E. Cellular Immunity

73. Describe the humoral immune response. F. The Humoral Immune Response

74. Compare and contrast the primary and secondary immune response in respect to time, antibody titer, antibody class produced, and affinity and avidity of antibodies produced.

75. Define the terms “affinity” and “avidity” as they relate to antibody production.

76. Draw a basic antibody molecule and be able to identify the following parts: G. Immunoglobulins

   Heavy chains
   Light chains
   Fab portion
   Fc portion
   Antigen binding site
   Disulfide bridges

77. List and describe the pieces formed when an antibody is treated with the enzymes papain and pepsin.

78. List and describe the characteristics and functions of the five classes of antibodies.

79. Define "clinically significant antibody" as it relates to the field of immunohematology. H. Clinical Significance of Blood Group Antibodies

80. Define “transfusion reaction” and list 8 potential causes.

81. Differentiate between “intravascular” and extravascular” red blood cell destruction.

82. State the three primary functions of complement. I. Complement

83. State the importance of complement as it relates to the field of blood banking.
84. Outline the steps and correct sequence of activation of the complement components involved in the classical and alternative (properdin) pathways.