Immunohematology II
Common Course Outline

Course Information
Revision History 2008-2009
Course Number MDLT 2807
Total Credits 2

Description
This course is a continuation of Immunohematology I. The student will receive further basic practical instruction in both the theory and practical aspects of Immunohematology. Areas of study include pretransfusion testing, transfusion therapy, adverse transfusion reactions, hemolytic disease of the newborn (HDN), hemolytic anemias, human leukocyte antigens (HLA), donor selection and component processing. This course is designed to prepare the student for practical training in Immunohematology.

Types of Instruction

<table>
<thead>
<tr>
<th>Instruction Type</th>
<th>Contact Hours</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Laboratory</td>
<td>16</td>
<td>1</td>
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<tr>
<td>Lecture (online)</td>
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<td>1</td>
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</tbody>
</table>

Prerequisites
MDLT 1810, MDLT 2806 or Program Director permission.

Exit Learning Outcomes

Core Abilities
A. Critical Thinking
B. Professionalism
C. Communication
D. Global Citizenship
E. Math Logic
F. Technological Literacy

Competencies
1. Apply principles of genetics and immunology to blood bank.
   Learning Objectives
   a. Understand the terms immunohematology, blood banking, and transfusion medicine.
   b. Name the major developments in the history of immunohematology.
   c. Define genotype and phenotype.
   d. Discuss the phenomena of dosage.
   e. Define immune response.
   f. Describe the two phases of humoral immune response.
   g. Describe the two ways antigen-antibody reactions are visualized in blood banking.
   h. Describe the factors that affect the two stages of agglutination.
   i. List the uses of the direct antiglobulin test (DAT) and the indirect antiglobulin test (IAT).
2. **Perform and interpret quality control measurements.**
   **Learning Objectives**
   a. Evaluate quality control results for acceptability and suggest corrective action.
   b. Discuss the technician's role in error management and corrective action.
   c. Recognize the regulatory and accrediting agencies influencing blood bank quality.
   d. Cite quality control criteria for reagents, equipment, and blood components.

3. **Interpret major blood group testing results including discrepancies.**
   **Learning Objectives**
   a. List the major antigens in the ABO, Rh, and other major blood group systems.
   b. Discuss the major theories of development/inheritance of antigens of the major blood group systems.
   c. Describe how the major blood group antigens are detected/identified.
   d. Discuss the characteristics of antibodies of the major blood group systems.
   e. List and explain various discrepancies in the major blood group systems.
   f. List the carbohydrates that give specificity to ABO antigens.
   g. Discuss the various mechanisms leading to the weak expression of the D antigen.
   h. List possible genotypes when given an Rh phenotype.
   i. State the clinical significance of the antibodies associated with the systems as they relate to transfusions and HDN.

4. **Interpret antibody screening and antibody identification results.**
   **Learning Objectives**
   a. Define antibody detection.
   b. Name the various stages in antibody detection and identification.
   c. List enhancement techniques used in antibody detection and identification.
   d. Interpret antibody screening and identification studies.
   e. Name various aids in antibody identification studies.
   f. List information about patients that may be helpful in antibody identification.
   g. Know how to investigate a positive direct antiglobulin test (DAT).

5. **Interpret compatibility testing results.**
   **Learning Objectives**
   a. Define compatibility testing.
   b. List the major steps of compatibility testing.
   c. List the various serological tests performed in compatibility testing.
   d. Name the limitations of serological compatibility testing.
   e. Describe the possible serological testing results and a likely cause and resolution.
   f. List and describe the circumstances with special compatibility testing protocols.

6. **Determine adverse transfusion reactions.**
   **Learning Objectives**
   a. List acute adverse transfusion reactions.
   b. List delayed acute adverse transfusion reactions.
   c. Describe the symptoms of various transfusion reactions.
   d. List diseases that can be transmitted via transfusion.
   e. Describe, in general terms, the course of treatment for adverse transfusion reactions.
   f. Describe the steps in an adverse transfusion reaction investigation.
7. **Discuss Human Leukocyte Antigen (HLA) system.**

   **Learning Objectives**
   a. Discuss the history/background of human leukocyte antigen (HLA).
   b. Explain major concepts of the MHC (major histocompatibility complex).
   c. Explain how the MHC appears to distinguish "self" from "nonself".
   d. Discuss MHC functions in relation to immune system responses.
   e. List and discuss the HLA classifications.
   f. List and state the purpose of HLA testing procedures presented by the instructor.
   g. List and discuss applications of HLA testing.

8. **Determine hemolytic disease of the newborn (HDN).**

   **Learning Objectives**
   a. List the criteria needed for HDN to occur.
   b. Describe the occurrence of events that lead to non-ABO HDN.
   c. Discuss the screening and detection of Rh HDN.
   d. Define "other" HDN.
   e. Discuss the use of quantitative tests for determining fetal-maternal bleeding.
   f. Define RhIg and know when to use it.
   g. List reasons RhIg might fail.
   h. List the criteria that blood must meet before it can be used for prenatal and postnatal transfusions.
   i. Discuss cord blood testing.

9. **Determine autoimmune hemolytic disease/conditions.**

   **Learning Objectives**
   a. Define autoimmune hemolytic disease.
   b. Compare and contrast warm and cold autoimmune hemolytic anemia.
   c. Define intravascular and extravascular hemolysis.
   d. List the four mechanisms responsible for drug-induced autoimmune hemolytic anemia.
   e. Name when to use autoabsorption technique.

10. **Resolve blood bank testing problems.**

    **Learning Objectives**
    a. List and explain discrepancies in pre-transfusion testing per the instructor's discretion.
    b. Resolve instructor assigned case studies.

11. **Identify blood donor requirements according to AABB standards.**

    **Learning Objectives**
    a. List the physical requirements that each donor must meet.
    b. Name the donor information that must be kept on file.
    c. List the medical criteria of prospective donors.
    d. Name the various anticoagulants used in blood donation.
    e. List the most common adverse transfusion reactions to donation.
    f. List the tests that are performed on collected blood.
    g. Name the special donor categories and the characteristics of each.

12. **Correlate component therapy with disease states/conditions.**

    **Learning Objectives**
    a. Cite the indications for transfusing each kind of blood product.
b. Name the goal of each of the special transfusion practices.
c. Note the blood components used in each of the special transfusion practices.