



Western Technical College
10513109 Blood Bank
Course Outcome Summary

Course Information

Description	Focuses on blood banking concepts and procedures including blood typing, compatibility testing, work ups for adverse reaction to transfusions, disease states and donor activities.
Career Cluster	Health Science
Instructional Level	Associate Degree Courses
Total Credits	4
Total Hours	108

Pre/Corequisites

Prerequisite 10513114 Urinalysis

Textbooks

Basic and Applied Concepts of Blood Banking and Transfusion Practices. 5th Edition. Copyright 2021. Howard, Paula R. Publisher: Elsevier Science. **ISBN-13:** 978-0-323-69739-2. Required.

Learner Supplies

Lab Coat - \$20. **Vendor:** Campus Shop. Required.

Safety Glasses. **Vendor:** Campus Shop. Required.

Sharpie Permanent Marker - Black. **Vendor:** Campus Shop. Required.

Three-ring binder. **Vendor:** Campus Shop. Required.

Success Abilities

1. Live Responsibly: Embrace Sustainability
2. Refine Professionalism: Act Ethically

High Impact Practices

1. Community Based Learning Project: a key learning outcome of this course is to connect academic learning and civic development while simultaneously addressing a community partner's needs, interests, or problems.

Program Outcomes

1. Practice laboratory safety and regulatory compliance
2. Collect and process biological specimens
3. Monitor and evaluate quality control in the laboratory
4. Apply modern clinical methodologies including problem solving and troubleshooting according to predetermined criteria
5. Correlate laboratory results to diagnosis of clinical conditions and/or diseases

Course Competencies

1. Integrate principles of genetics and immunology to blood bank

Assessment Strategies

- 1.1. Oral, Written or Graphic Assessment

Criteria

- 1.1. assessment includes a definition of the genetics problem
- 1.2. assessment includes an analysis of the problem from the information provided related to parents and or children
- 1.3. assessment includes a description or a diagram of viable solutions
- 1.4. assessment includes a definition of the problem related to immunology principles
- 1.5. assessment includes an analysis of the problem using immunology principles
- 1.6. assessment includes a description of viable solutions
- 1.7. assessment identifies the solution most likely to solve the problem
- 1.8. assessment includes an explanation of why the solution is the best
- 1.9. classification list is correctly sorted into the categories such as types of antibodies (class, clinical significance) and antigens (carbohydrates, proteins, soluble substances etc.)

2. Interpret ABO test results including discrepancies

Assessment Strategies

- 2.1. Oral, Written or Graphic Assessment
- 2.2. Laboratory Practical Assessment

Criteria

- 2.1. you label tubes by appropriate means to distinguish between ABO cells and serum testing
- 2.2. you demonstrate proper technique for ABO testing
- 2.3. lab report includes the ABO test results
- 2.4. you interpret both cells and serum testing for the ABO group accurately from your test results
- 2.5. you distinguish between various types of ABO discrepancies and identify methods of resolving the discrepancies

2.6. lab report is neatly handwritten in ink; corrections are properly documented

3. Interpret Rh test results including discrepancies

Assessment Strategies

- 3.1. Oral, Written or Graphic Assessment
- 3.2. Laboratory Practical Assessment

Criteria

- 3.1. you demonstrate proper technique for Rh testing including weak D
- 3.2. lab report includes the Rh test results
- 3.3. you interpret cell testing for the Rh group accurately from your test results
- 3.4. you distinguish between various types of Rh false positives and negatives and identify methods of resolving the discrepancies.
- 3.5. you select appropriate patient types that require weak D testing
- 3.6. you select appropriate positive and negative controls when performing Rh phenotyping
- 3.7. you select the most likely Rh genotype from Rh phenotyping results
- 3.8. lab report includes a description of the conclusions you drew and why when performing Rh testing
- 3.9. lab report is neatly handwritten in ink; corrections are properly documented
- 3.10. lab report uses appropriate Blood Banking vocabulary and symbols

4. Interpret direct antiglobulin testing (DAT) results

Assessment Strategies

- 4.1. Oral, Written or Graphic Assessment
- 4.2. Laboratory Practical Assessment

Criteria

- 4.1. you demonstrate proper technique for direct antiglobulin testing (DAT)
- 4.2. you use appropriate anti-human globulin reagent for situation
- 4.3. lab report is accurate
- 4.4. lab report includes the results (including control cells results)
- 4.5. lab results are properly interpreted
- 4.6. lab report uses appropriate blood banking vocabulary
- 4.7. lab report is written in ink; corrections are properly documented

5. Interpret indirect antiglobulin testing (IAT)

Assessment Strategies

- 5.1. Oral, Written or Graphic Assessment
- 5.2. Laboratory Practical Assessment

Criteria

- 5.1. you demonstrate proper technique for IAT
- 5.2. you use appropriate reagents for situation
- 5.3. lab report is accurate
- 5.4. lab report includes the results (including control cells results)
- 5.5. lab results are properly interpreted
- 5.6. lab report uses appropriate blood banking vocabulary
- 5.7. lab report is written in ink; corrections are properly documented

6. Interpret cross-match results

Assessment Strategies

- 6.1. Oral, Written or Graphic Assessment
- 6.2. Laboratory Practical Assessment

Criteria

Your performance will be successful when:

- 6.1. you demonstrate proper technique for crossmatch testing
- 6.2. you select the appropriate ABO and Rh type for donor units to be crossmatched.
- 6.3. you select the appropriate type of crossmatch due to antibody test results and previous blood bank records
- 6.4. lab report includes the results (including control cells results)

- 6.5. lab results are properly interpreted
- 6.6. lab report is accurate
- 6.7. lab report uses appropriate blood banking vocabulary
- 6.8. lab report is written in ink; corrections are properly documented

Learning Objectives

- 6.a. Discuss the limitations of the test.
- 6.b. Explain the difference between major, minor, immediate spin, and electronic crossmatch.
- 6.c. Explain emergency, massive, autologous, and directed donor transfusions.
- 6.d. Define blood banking vocabulary related to crossmatching.

7. Identify other blood group systems

Assessment Strategies

- 7.1. Oral, Written or Graphic Assessment

Criteria

Your performance will be successful when:

- 7.1. comparison is based on your findings in relationship to types of antibodies, types of antigens, clinical significance and expected results on antibody screenings
- 7.2. comparison includes the similarities between the items
- 7.3. comparison includes the differences between the items
- 7.4. comparison includes logical conclusions drawn from the comparison related to possible expected test results for antibody screenings and crossmatches
- 7.5. comparison uses appropriate blood banking vocabulary

Learning Objectives

- 7.a. Identify the characteristics of other blood group systems.
- 7.b. List other blood group systems and determine their significance.
- 7.c. Define the vocabulary related to other blood group systems.

8. Evaluate quality assurance practices in transfusion medicine

Assessment Strategies

- 8.1. Oral, Written or Graphic Assessment

Criteria

- 8.1. you evaluate daily QC procedures
- 8.2. you interpret the QC data
- 8.3. you suggest possible corrective actions for QC problems
- 8.4. relevant data is collected and recorded completely
- 8.5. reagent sources and lot numbers are identified
- 8.6. data analysis includes interpretation of the results

9. Interpret antibody identification results of Rh and other Blood Group Systems

Assessment Strategies

- 9.1. Oral, Written or Graphic Assessment
- 9.2. Laboratory Practical Assessment

Criteria

Your performance will be successful when:

- 9.1. cell panel sources and other reagents sources are identified
- 9.2. data collection from antibody identification testing is accurate
- 9.3. data is recorded completely (including grading of reactions) and accurately
- 9.4. data collected on follow-up testing is relevant
- 9.5. data is presented in a chart that is accurate and easy to read
- 9.6. data results are organized and clearly communicated including the grading of reactions and the phases tested and quality control testing performed
- 9.7. data analysis includes a written description and analysis of the results
- 9.8. data analysis makes a recommendation based on the results related to transfusions, hemolytic disease of the newborn or autoimmune hemolytic anemia that is clearly supported by the data
- 9.9. lab report includes an analysis of the test results

- 9.10. lab report includes follow-up testing performed or recommended to confirm the presence of specific antibody(y)ies such as antigen testing and probability testing (3 positive and 3 antigen-negative test)
- 9.11. lab report includes a description of the conclusions you drew and why
- 9.12. lab report is neatly handwritten in ink; corrections are properly documented

Learning Objectives

- 9.a. Explain when an antibody screen should be followed by an antibody identification for transfusion recipients, blood donors, and obstetrical patients.
- 9.b. Describe the method of crossing out on the antigen matrix to narrow down the antibody specificity.
- 9.c. Describe how multiple antibodies are recognized and identified.
- 9.d. Explain how dosage may affect antibody identification.
- 9.e. Explain the significance of a positive autocontrol when doing antibody identification.
- 9.f. Distinguish between the significance of a weak positive or mixed field autocontrol and an autocontrol of 2+ or greater.
- 9.g. Describe what steps to follow when the autocontrol is positive.
- 9.h. Discuss the usefulness and the limitations of phenotyping the patient when doing antibody identification.
- 9.i. List four methods that may be used to potentiate weak antibody reactions, and describe the mode of action of each. <p>
- 9.j. Correctly perform all steps of an antibody identification procedure, identifying any and all antibodies present within a 95% confidence level within the limits of materials available with cell panels and patient phenotyping.

10. Resolve Blood Bank testing problems.

Assessment Strategies

- 10.1. by written exam
- 10.2. by performing blood bank testing and resolving problems as they arise

Criteria

You will know you are successful when:

- 10.1. you demonstrate proper technique
- 10.2. you troubleshoot blood bank testing problems
- 10.3. you identify methods of resolving discrepancies
- 10.4. you score a C or better on written exam

Learning Objectives

- 10.a. Discuss blood bank testing results and interpretations
- 10.b. Identify discrepancies in ABO testing
- 10.c. Describe false positive and false negative reactions related to the AHG test

11. Determine transfusion reactions

Assessment Strategies

- 11.1. Oral, Written or Graphic Assessment

Criteria

Your performance will be successful when:

- 11.1. lab report includes an overview of the procedures used in Blood Bank for Transfusion Reactions
- 11.2. lab report includes a list of the materials, equipment, and steps used to conduct the experiment
- 11.3. lab report includes the results of testing
- 11.4. lab results are presented in a chart
- 11.5. lab report includes a description of the conclusions you drew and why
- 11.6. lab report includes an appendix of supporting documentation on which you based your interpretation
- 11.7. lab report is neatly handwritten or electronically submitted; corrections properly documented
- 11.8. lab report uses appropriate blood banking vocabulary
- 11.9. case study response demonstrates a thorough understanding of relevant aspects of the transfusion reaction
- 11.10. transfusion reaction case study response outlines in detail the decision selected by you
- 11.11. transfusion reaction case study response includes an explanation of why the decision was selected
- 11.12. transfusion reaction case study response is supported by relevant evidence

Learning Objectives

- 11.a. Distinguish between the types of samples to be collected from a patient when doing a transfusion reaction workup.
- 11.b. Describe the steps to be taken by lab personnel in a basic transfusion reaction workup.
- 11.c. Describe the steps involved in an extended transfusion reaction investigation, when an extended workup would be performed.
- 11.d. List at least three tests that would be done in further testing beyond an extended workup.
- 11.e. Discuss the kinds of hemolytic transfusion and non-hemolytic transfusion reactions with regard to: cause, symptoms and severity, relative frequency, laboratory findings, prophylaxis.
- 11.f. Explain how a delayed transfusion reaction occurs.
- 11.g. Interpret a transfusion reaction workup.
- 11.h. Perform elution procedures when necessary.
- 11.i. Interpret the results of an eluate

12. Determine hemolytic disease of the newborn (HDN)

Assessment Strategies

- 12.1. Oral, Written or Graphic Assessment

Criteria

Your performance will be successful when:

- 12.1. lab report includes an overview of the procedure used in Blood Bank for Hemolytic Disease of the Newborn (HDN)
- 12.2. lab report includes a the results of the testing
- 12.3. lab report includes a description of the conclusions you drew and why
- 12.4. lab report includes an appendix of supporting documentation upon which you based your interpretation
- 12.5. lab report uses appropriate blood banking vocabulary
- 12.6. case study response demonstrates a thorough understanding of relevant aspects of the HDN case
- 12.7. case study response includes an explanation of why the decision was selected
- 12.8. case study response outlines in detail the decision selected by the learner
- 12.9. case study response is supported by relevant evidence

Learning Objectives

- 12.a. Describe how HDN occurs and the symptoms.
- 12.b. Distinguish between the more common blood group antibodies that cause HDN and those that do NOT cause HDN..
- 12.c. List the differences between ABO and RH HDN regarding: antibodies involved, severity, detection, treatment, HDN laboratory workup results.
- 12.d. Explain how HDN is initially detected.
- 12.e. Explain what further testing is done on both parents if HDN is detected.
- 12.f. Explain how the severity of HDN is monitored during the pregnancy including antibody titration, amniocentesis and Percutaneous Umbilical Blood Sampling.
- 12.g. Discuss indications for and methods of intrauterine transfusion and exchange transfusions.
- 12.h. List the criteria for selection of blood for intrauterine transfusion and exchange transfusions.
- 12.i. Identify solutions to problems occurring in HDN and Rh immune globulin workups.
- 12.j. Select the appropriate elution method to perform when the baby has a positive DAT
- 12.k. Explain the purpose of Rh immune globulin.
- 12.l. Describe the method of action of Rh immune globulin.
- 12.m. Describe the steps involved in a Rh immune globulin workup.
- 12.n. List the criteria to determine Rh immune globulin eligibility.
- 12.o. State the standard dose of Rh immune globulin.
- 12.p. Explain why multiple doses of Rh immune globulin may sometimes be required.
- 12.q. Describe the principle and general procedure of each of the following tests: rosette test, Kleihauer-Betke test and ELAt test.
- 12.r. Explain how antenatal Rh immune globulin may affect the results of the workup done at delivery.
- 12.s. Name two other clinical situations (besides pregnancy and delivery) where use of Rh immune globulin may be indicated.
- 12.t. Correctly perform and interpret Rh immune globulin workups; including determination of eligibility for Rh immune globulin based on the results of a workup.
- 12.u. Perform and interpret the rosette test for fetal maternal hemorrhage to determine the need for multiple doses of Rh immune globulin

13. Identify blood donor requirements according to AABB standards

Assessment Strategies

- 13.1. oral, written, or graphic assessment where you decide whether a donor is acceptable, temporary deferral, or permanent deferral

Criteria

- 13.1. evaluation includes general information about the donor interview process
- 13.2. evaluation includes information that will determine whether or not a donor is acceptable, temporary deferral, or permanent deferral
- 13.3. evaluation questions are directly related to donor qualifications
- 13.4. evaluation provides relevant details; including temporary deferral time lines

14. Correlate component therapy with disease states/conditions

Assessment Strategies

- 14.1. Oral, Written or Graphic Assessment

Criteria

- 14.1. assessment is based on important features and attributes of component therapy
- 14.2. assessment includes criteria for proper storage of blood bank components
- 14.3. assessment includes similarities of components
- 14.4. assessment includes differences between components
- 14.5. assessment includes evaluation of therapeutic uses of blood bank products