Clinical Performance Objectives in Blood Banking
Department of Medical and Research Technology
University of Maryland School of Medicine
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Upon completion of the **Clinical Blood Banking** rotation the **MLS** student will be able to:

I. SPECIMEN HANDLING AND PROCESSING/LABORATORY SAFETY

1. Follow departmental protocol and demonstrate safe work practices by:

    - Wearing personal protective equipment (PPE) as required.
    - Handling and disposing of contaminated materials according to standard precautions.
    - Handling chemicals/reagents according to safety procedures.

2. Identify the types of blood samples and collection tubes appropriate for routine testing in the blood bank.

3. Determine the acceptability of a sample for compatibility testing based on sample age, sample appearance and institutional policy.

4. List the minimum information required for labeling samples for blood bank testing at the facility.

II. QUALITY ASSURANCE/QUALITY CONTROL AND REGULATORY ISSUES

1. Perform daily quality control for routine testing according to the operating procedures of the laboratory with 100% accuracy.

2. Recognize discrepant results in routine ABO, Rh and antibody screen testing to the satisfaction of the clinical instructor.

3. Report all discrepant results to the clinical instructor.

4. Read the policies and procedures for the quality control activities that are performed monthly, quarterly, bi-annually and annually.

5. Perform or observe basic laboratory computer applications where relevant.

6. List the accrediting and inspection agencies that monitor blood banks and transfusion services.

III. ROUTINE TECHNICAL PROCEDURES – ABO/RH, AB SCREEN AND DAT

1. Using a "0 to 4+" scale, grade macroscopic agglutination reactions within ± 1 agglutination grade of the instructor.

2. Prepare a 3-5% red cell suspension as needed for tube testing.

3. Label test tubes for routine testing according to laboratory procedure without error.

4. Perform ABO and Rh testing on a minimum of 25 samples with 100% accuracy according to the procedure.

5. Interpret the results of ABO and Rh testing without error.

6. Perform weak D testing on designated patient samples when available according to the procedure.

7. Perform ABO confirmatory testing on a minimum of 20 donor segments with 100% accuracy according to the procedure.

8. Discuss the importance of subgroups of A with regard to routine testing and component selection.

9. Recommend a plan of action for the preliminary investigation of the following ABO discrepancies:

    - Hypogammaglobulinemia
    - Cold reacting alloantibody
    - Cold reacting autoantibody
    - Subgroup of A with anti-A1
    - Mixed field agglutination

10. Identify mixed field agglutination in a minimum of 2 samples to the satisfaction of the clinical instructor.

11. Perform antibody screening on a minimum of 20 samples to the satisfaction of the clinical instructor.

12. Select the next step/s to be taken to investigate a positive antibody screen.

13. Identify sources of false negative and false positive error in antiglobulin testing.

14. Perform DAT and DAT Battery on a minimum 2 samples to the satisfaction of the clinical instructor.

15. Discuss alternatives in routine testing such as gel or solid phase.

IV. ROUTINE TECHNICAL PROCEDURES – CROSS-MATCHING AND TRANSFUSION MANAGEMENT

1. Label test tubes for routine compatibility testing according to laboratory protocol without error.

2. Perform the appropriate crossmatch procedure, immediate spin (IS) or Full (IAT), on a minimum of 10 samples when given the relevant patient information and the policy of the laboratory. Electronic crossmatches if performed at the site may also be included.

3. Select the most appropriate donor units to crossmatch with a patient when ABO specific red cells are available and when not available.

4. Select the most appropriate donor units when the patient presents with:

    - single alloantibody
    - basic multiple alloantibodies

5. Interpret the results of crossmatching with 100% accuracy.

6. Identify causes of an incompatible crossmatch when given the results of pre-transfusion testing.

7. Summarize the lab process for emergency release and massive transfusion after reading the related procedures and policies.

8. Differentiate ABO and Rh-related HDN according to clinical and serologic presentation.

9. If available, perform or discuss the prenatal (mother) and postnatal (mother and newborn) serologic workups for managing cases of HDN.

10. Observe or discuss the procedures for RhIg administration including candidate selection, FMH screening, and dosage determination.

11. Create a chart differentiating the following adverse reactions to transfusion with regard to cause, classic signs & symptoms, and serologic investigation (if applicable) after reviewing the current *Circular of Information for the Use of Human Blood and Blood Components*:

Immediate Hemolytic	Urticarial
Delayed Hemolytic	Anaphylactic
Febrile Non-hemolytic	Bacterial sepsis
TRALI	TACO
Platelet refractoriness	

12. Recommend approaches for future transfusion in patients who have experienced the transfusion reactions listed above.

13. Perform or describe a minimum of 1 transfusion reaction work-up, according to laboratory protocol.

14. Create a table classifying warm and cold reacting autoantibodies according to antibody type, reactivity and methods of testing.

V. REFERENCE PROCEDURES

1. Perform routine antibody identification panels on a minimum of 5 samples according to the acceptable precision of the laboratory.

2. Interpret the results of routine and selected cell panels to determine the specificity of single and multiple antibodies (simple).

3. Perform or discuss the following reference techniques to assist in antibody identification:

   - Selected cell panel
   - Red cell (antigen) phenotyping
   - Enhancement media (PeG & LISS)
   - Acid Elution
   - Pre-warmed technique
   - Enzyme treatment
   - Neutralization
   - Adsorption
   - Saline replacement
   - ReST
   - Cold panel (optional)

4. Summarize the procedure and limitations of red cell phenotyping for 2 different anti-serums (one IS and one IAT) after reading the manufacturers package insert.

5. Create a chart presenting the serologic characteristics of antibodies to the following blood group systems:

Rh	Kell
Kidd	Duffy
MNSs	Lewis
Lutheran	I
P_1	

6. Select 5 antigens of low incidence and 5 antigens of high incidence when given an antibody panel sheet (or antigram).

VI. DONOR /COMPONENTS/PRODUCT DISPOSITION

1. Summarize the physical and medical criteria used in the selection of the following blood donors after reading the related current *AABB Standards:*

    - Allogeneic
    - Autologous
    - Directed
    - Therapeutic (optional)

2. Summarize the processes of donor selection and whole blood unit collection after reading the relevant chapter/s in the current *AABB Technical Manual* on:

    - Donor history
    - Physical exam
    - Donor acceptability
    - Proper unit collection and handling

3. List the blood bank and viral marker testing required on all allogeneic, autologous and directed units after reading the related current *AABB Standards.*

4. *Summarize* the preparation and handling of the following blood components after reading the relevant chapter/s in the *current AABB Technical Manual.*

    - Packed red blood cells
    - Fresh frozen plasma
    - Apheresis platelets (single donor)
    - Cryoprecipitate

5. Discuss and/or observe the following forms of blood product handling and manipulation: Include 2 indications for each.

    - Thawing
    - Pooling
    - Aliquoting
    - Washing
    - Irradiating

6. Create a chart on the contents, shelf life, storage requirements and therapeutic use of the following blood products as addressed in the current *Circular of Information for the Use of Human Blood and Blood Components*:

    Packed red blood cells
    Apheresis platelets (single donor)
    Frozen red blood cells
    Irradiated red blood cells
    Factor VIII & IX concentrates
    CMV-neg red blood cells
    Fresh frozen plasma & PF24
    Cryoprecipitate (single unit & pooled)
    Leukocyte Reduced red blood cells
    Washed red blood cells
    Rh Immune globulin

7. Review the daily inventory and inspection of blood products.
    - Observe routine process for receiving or shipping blood products

8. Issue or observe the issue (release) of a minimum of 5 blood products for administration.

9. Summarize the rationale for the use of bacteria detection methods on platelet products after reading the related current *AABB Standards.*

10. Discuss the special transfusion protocol or handling procedure for the following after reading the related policies and procedures (or current *AABB Technical Manual*):

    - ABO discrepancy
    - Subgroup of A with anti-A1
    - Neonates
    - Intrauterine transfusion
    - Oncology patient
    - Sickle cell Anemia
    - Autoimmune hemolytic anemia
    - IgA deficiency

VII. PROFESSIONAL QUALITIES

1. Arrive at the laboratory on time and return from lunch/breaks on time.

2. Adhere to the established student uniform policy of the MLS program.

3. Notify the clinical supervisor of any unavoidable absences prior to the scheduled arrival time and make arrangements to make up the time on a mutually convenient date.

4. Demonstrate the ability to follow verbal and written instructions including written protocols and procedures and ask pertinent questions.

5. Communicate in a constructive, professional manner (i.e. polite, considerate, pleasant and unhurried) with members of the laboratory and hospital staff, peers and patients.

6. Organize work in a logical sequence.

7. Complete work and assignments within established deadlines.

8. With the approval of the clinical instructor, demonstrate the initiative to perform tasks without being reminded.

9. Demonstrate constructive utilization of all training time by examining available study materials during periods of time not devoted to instruction.

10. Demonstrate flexibility in changes to the scheduled daily learning activities due to laboratory staffing, emergencies, etc.

11. Demonstrate the ability to recognize and admit mistakes or discrepancies in laboratory protocols and/or results and, take appropriate corrective measures, including seeking help and notifying staff when needed.

12. Demonstrate the ability to accept professional constructive criticism regarding work.

13. Maintain the confidentiality of all patient information at all times in accordance with HIPPA regulations. This applies to patients or other unauthorized individuals and extends beyond the confines of the clinical setting.

14. Adhere to all published safety regulations in the laboratory.

15. Demonstrate professionalism in attitude, appearance and work ethic 100% of the time.

16. Adhere to standards and regulations regarding proper access and utilization of institutional computers.

17. Adhere to policies of the affiliate regarding the use of ALL electronic devices, including but not limited to, portable music players such as MP3 and Smart/cell phones.