

## **Blood Bank**

### **General:**

The core curriculum requires at least 2 months of training in Blood Bank. The first rotation is a 1 month block scheduled in the PGY1 or PGY2 year. The second month is generally completed during either the PGY3 or PGY4 year. The rotation occurs primarily in the Blood Bank in the South Tower (Cancer Center); however, the service covers all UF Health and Shands facilities in Gainesville.

### **Blood Bank Rotation Goals:**

*(applicable ACGME core competencies are in parentheses)*

1. Be an effective blood bank consultant to staff and housestaff and technical personnel by interpreting immunohematological test results, recommending the appropriate products based on the clinical situation, diagnosing adverse reactions and assisting with monitoring the clinical effectiveness of product administration. *(Medical Knowledge, Systems Based Practice, Interpersonal and Communication Skills, Professionalism)*
2. Have a working knowledge of the scientific basis and technical performance of immunohematologic testing for transfusion services and donor services. *(Medical Knowledge)*
3. Know and apply the eligibility requirements for allogeneic and autologous blood donation and know when and how to employ the donor look-back process. *(Medical Knowledge, Systems Based Practice)*
4. Demonstrate understanding of current good manufacturing practices involved in collection, processing and storage of all blood bank therapeutic products. *(Medical Knowledge)*
5. Have a working knowledge of the information management systems used in transfusion services and donor center (i.e., DIBBS and CHCS). *(Medical Knowledge, Systems Based Practice)*
6. Understand the basic concepts necessary to manage both transfusion and donor services including meeting regulatory standards (AABB, FDA, CAP, JCAHO), inventory management, proficiency testing, quality control, workflow organization, occupational safety and employer-employee interaction. *(Systems Based Practice)*
7. Know the requirements and organization of blood product distribution for the Army and Air Force. *(Systems Based Practice)*

### **Graded Expectation:**

PGY 1 or first 1-month block: The resident performs under direct observation. This means that the resident contacts staff prior to initiating patient testing, authorizing product release, working up transfusion reactions, initiating therapeutic apheresis or engaging in any activity that can directly and immediately affect patient care. An exception to this is donor screening. After week 3 the resident is expected to be able to make the appropriate disposition on donor related issues and present them to the staff later either during the day or during morning report.

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Subsequent rotations: The resident will perform under direct observation for the first 2 weeks as they re-acclimate to the Blood Bank. After 2 weeks, the residents are expected to be able to operate under indirect supervision for all activities.

### **Week 1-2**

Reading: Harmening, 5<sup>th</sup> ed., Ch. 1,11,5,12-13, 16-18 (in that order).

AABB Technical Manual, 17<sup>ed</sup> Ch. 5-9, 15-17.

AABB primer on blood transfusion (optional)

Stack, Practical guide to Transfusion Medicine, 2<sup>nd</sup> ed, Ch1-3

Demonstrate proficiency in the following areas:

- The criteria for donor selection
- Confidential unit exclusion system
- Special criteria for autologous and directed donors
- Symptoms, etiology and therapy of donor reactions
- Blood component preparation, storage and preservation
- Clinical significance of red cell antibodies
- Red cell panel analysis
- Principle and sources of error of the anti-human globulin test
- Clinical significance of the positive direct anti-human globulin test
- Special techniques to work up patients with cold agglutinins or warm auto-antibodies
- Screening criteria for platelet donors and the maximum frequency of donation
- FDA recommendations on platelet apheresis
- Symptoms, etiology and therapy of donor reactions specific to apheresis procedures
- Indications for therapeutic plasma exchange and cell depletion
- Protocol for initiation of therapeutic apheresis regimen on a patient
- Indications and expected effect of each type of blood product
- Indications for special blood processing or selection such as irradiation, leukopoor filters, washing and CMV negative
- Indications and follow-up of switching Rh types
- Etiology, symptomatology, therapy and prevention of transfusion reactions
- Factors influencing antigen-antibody reactions and methods of enhancement of agglutination
- Donor deferral and reinstatement algorithms
- Acquired and congenital types of polyagglutination and their clinical significance

### **Week 3**

Reading: Harmening 5<sup>th</sup> ed., Ch. 6-10.

AABB Technical Manual, 17<sup>th</sup> ed., Ch. 10-14.

Stack, Practical guide to Transfusion Medicine, 2<sup>nd</sup> ed, Ch 4,5

Demonstrate proficiency in the following areas:

- ABO genetics and biochemistry

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- Etiologies of ABO discrepancies
- Genetics of Lewis, P and I systems
- Genetics and biochemistry of MNS system
- Genetics and clinical significance of Kell, Duffy, Kidd and Lutheran blood group systems
- Clinical significance of other blood groups and high and low frequency antigens
- Genetics and nomenclature of Rh system. Be able to translate between Fisher-Race, Wiener and Rosenfield nomenclature.

### **Week 4**

Reading: Harmening 5<sup>th</sup> ed., Ch. 19-21  
AABB Technical Manual, 17<sup>th</sup> ed., Ch. 8, 22-23.  
Stack, Practical guide to Transfusion Medicine, 2<sup>nd</sup> ed, Ch 7, 11

Demonstrate proficiency in the following areas:

- Principles of ELISA testing and cut-off determination
- Clinical interpretation of hepatitis marker testing
- Interpretation of HIV Western blot
- Donor deferral and reinstatement algorithms
- Special procedures and components for transfusion to neonates
- Diagnosis and therapy for hemolytic disease of the newborn
- Serologic findings and clinical aspects of autoimmune and drug induced immune mediated hemolytic anemias

### **Week 5**

Reading: Harmening 5<sup>th</sup> ed., Ch. 2-4, 22, 23  
AABB Technical Manual, 17<sup>th</sup> ed., Ch. 10-11, 18,19, 29,30.  
Stack, Practical guide to Transfusion Medicine, 2<sup>nd</sup> ed, Ch 11

Demonstrate proficiency in the following areas:

- Genetics and biochemistry of MHC locus products
- Methods of detection of antibodies to HLA, granulocyte and platelet specific antigens
- Clinical significance of MHC in organ and bone marrow transplantation
- Clinical significance of HLA, granulocytes and platelet antigens in transfusion
- Approaches to provide platelet support to an alloimmunized refractory patient
- Genetics of red cell antigens
- Definition of direct and indirect exclusion of paternity
- Etiologies of false direct and indirect exclusions
- Principles of calculation of paternity index, probability of paternity and power of exclusion

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### **Week 6**

Reading: Harmening 5<sup>th</sup> ed., Ch. 14, 15, 24-27  
AABB Technical Manual, 17<sup>th</sup> ed., Ch. 1-4, 24, 28.  
Stack, Practical guide to Transfusion Medicine, 2<sup>nd</sup> ed, Ch 15

Demonstrate proficiency in the following areas:

- Differences in emphasis between the FDA, CAP and AABB accreditation requirements
- Implications of control activities versus record keeping activities in blood bank computers
- Legal implications of product versus service definition of human blood
- Difference between quality control and quality assurance
- System of review of abnormal findings on patients and donors and record keeping of findings that may impact future transfusions or donations

### **Week 7-8**

Reading: Chaffin notes

Demonstrate proficiency in the following areas:

- Review board practice questions
- Complete any unfinished goals
- Transition to indirect supervision

### **Subsequent rotations**

Reading: Harmening 5<sup>th</sup> ed. all chapters.  
Mintz, Transfusion therapy Clinical Principles and Practice, 3<sup>rd</sup> ed

Tasks:

- Triulzi, Transfusion Medicine Self-Assessment and review 2<sup>nd</sup> Ed
- Finish reading Harmening, Tech Manual, SBB AABB review hand out,
- Demonstrate the ability to function under indirect supervision in all activities of transfusion service and donor center
- Teach junior residents and medical students