



Association for the
Advancement of
Blood & Biotherapies

AABB Blood Banking & Transfusion Medicine 101 Course

Syllabus

Contents

Purpose/Overview	2
Program Format	2
Intended Audience	2
Program Planners/Curriculum Developers	2
Continuing Education Credit	2
Curriculum	3
Topic Overview	3
Topic 1: Industry Review/Overview	3
Topic 2: Blood Banking Fundamentals	5
Topic 3: Transfusion Medicine Fundamentals	6
Topic 4: Regulatory/Compliance Deep Dive	8

Purpose/Overview

AABB is pleased to offer an educational course focusing on Blood Banking/Transfusion Medicine 101/Fundamentals. With the changing workforce, workforce shortages, those entering this field with none or limited exposure/experience and many positions requiring less educational and/or experience requirements, this program aims to educate these individuals and to serve as a framework for further educational and professional development pursuits.

Program Format

The program consists of 24 recorded presentations in varying lengths covering 24 subtopics within the 4 main topics as outlined below. This program is housed in the [AABB Education Platform](#). Learners will have unlimited access to the content for up to 2 years.

Intended Audience

This program will be basic in nature and is designed for professionals who want to learn the fundamentals of blood, blood banking and transfusion medicine.

Program Planners/Curriculum Developers

The curriculum for this course was developed by (titles and affiliations at the time of program development):

Anne Chenoweth, MBA, MT(ASCP)CM, CQA(ASQ)
Senior Director, Accreditation and Quality
AABB
Bethesda, MD

Justin D. Kreuter, MD
Consultant, Transfusion Medicine
Medical Director, Blood Donor Program
Associate Medical Director, Histocompatibility
Laboratory
Department of Laboratory Medicine & Pathology
Mayo Clinic
Rochester, MN

Kerry O'Brien, MD
Medical Director, Blood Bank & Clinical Pathology
Residency Program
Director, Beth Israel Deaconess Medical Center
Assistant Professor Pathology, Harvard Medical School
Boston, MA

Continuing Education Credit

This program is eligible for 16 continuing education credits/contact hours for General Participation, California Lab Personnel or Florida Lab Personnel. The number and type of credits awarded for this program was determined by the program duration. This program is not eligible for continuing education credits for physicians or California Nurses. A certificate of participation for the course will be provided to learners. For more information on each credit type please visit our [Continuing Education Credits webpage](#).

Curriculum

Topic Overview

The AABB Blood Banking and Transfusion Medicine Fundamentals 101 course is broken into 4 main topics:

- Topic 1: Industry Review/Overview
- Topic 2: Blood Banking Fundamentals
- Topic 3: Transfusion Medicine Fundamentals
- Topic 4: Regulatory/Compliance Deep Dive

The subtopics and learning objectives follow:

Topic 1: Industry Review/Overview

Part I (Donor to Facility)

Subtopic & Learning Objectives	Presenter*
<p>Overview of the Blood Pipeline (Donor to Manufacture to Hospital to Patient)</p> <ul style="list-style-type: none"> • Compare and contrast the eligibility requirements for allogeneic and autologous blood donations. • Describe in basic terms blood component preparation, storage, and processing. • Distinguish transfusion transmitted infections including HIV, hepatitis, HTLV, bacteria, CJD, syphilis, malaria, babesia, and Chagas disease. 	<p>Eva D. Quinley, MS, MT(ASCP)SBB Regional Director Vitalant- Illinois Rosemont, IL</p>
<p>Ecology of Blood (who collects what, who oversees manufacture, who oversees inventory mgt, who orders blood)</p> <ul style="list-style-type: none"> • Define and discuss medical professionals who collect, oversee or manufacture blood components. • Describe the role of the FDA, CLIA and other regulatory bodies in blood manufacturing. • Explain the operational logistics required in determining appropriate blood inventory for a geographic region and the process of meeting daily, weekly, and monthly collection goals. 	
<p>Blood Banking: Global Environment</p> <ul style="list-style-type: none"> • Describe the factors that influence the motivation of volunteers to donate blood. • Discuss the global environment and the move to voluntary blood donation. • Describe the roles of National Blood Services and the World Health Organization (WHO). 	<p>Christine Bales, BS, MT (ASCP) I, CQA (ASQ) Vice President, Consulting and Global Services AABB Division of Global Services AABB Bethesda, MD</p>

Part II (Facility to the Patient)

Subtopic & Learning Objectives	Presenter
<p>Transfusion Medicine as Applied Immunology</p> <ul style="list-style-type: none"> Define and discuss blood types and their place in the practice of transfusion. Describe the process to find compatible blood components. Identify how rare blood needs are met (intro of the rare donor program). 	<p>Susan T. Johnson, MSTM, MT(ASCP)SBB Director, Clinical Education & Director, Specialist in Blood Banking (SBB) Program, Versiti Wisconsin Director, Transfusion Medicine Program, Marquette University Milwaukee, WI</p>
<p>Transfusion Medicine as Applied Coagulation</p> <ul style="list-style-type: none"> Explain the role of blood components in coagulation. Discuss the use of transfusion medicine as a therapy for coagulopathies. Discuss the issues in the use of different blood components for coagulation. Introduce factor concentrates and in many cases may be in the pharmacy and not the blood bank but part of the equation (most common ones). 	<p>Annie Winkler Vice President, Reagent R&D and Medical Affairs Instrumentation Laboratory, A Werfen Company Burlington, MA</p>
<p>Transfusion Medicine for Oxygen Delivery (i.e., the why of RBCs)</p> <ul style="list-style-type: none"> Explain the use of blood components in immunohematology. Discuss the use of transfusion medicine as a therapy for various conditions that involve oxygen delivery. Recognize the multiple factors that contribute to the decision to transfuse. Define and discuss blood types and their place in the practice of transfusion. 	<p>Allan M. Klompas, MB, BCh, B.A.O. Mayo Clinic Rochester Rochester, MN</p>

Part III

Subtopic & Learning Objectives	Presenter
<p>Challenges in this area</p> <ul style="list-style-type: none"> Define and discuss the issues with proper use of blood components. Review the rise of patient blood management strategies. Discuss the sustainability of the blood supply. 	<p>Jonathan H. Waters, MD Professor & Vice Chair, Clinical Research, Dept of Anesthesiology, University of Pittsburgh School of Medicine Professor, Swanson School of Engineering, Department of Bioengineering, University of Pittsburgh Chief of Anesthesia Services, Magee Womens Hospital of UPMC Medical Director, UPMC Patient Blood Management Program & UPMC Bloodless Medicine Program Pittsburgh, PA</p>

Topic 2: Blood Banking Fundamentals

Subtopic & Learning Objectives	Presenter
<p>Blood Centers 101</p> <ul style="list-style-type: none"> Describe the efficiencies provided by blood centers. Appreciate inventory management strategies of blood centers. Describe the role of blood centers in recruitment of donors, collection of units, infectious disease screening, further processing and distribution of various blood components. Discuss some of the additional roles such as Immunohematology reference laboratories, and apheresis collection programs. 	<p>Jed B. Gorlin, MD, MBA Medical Director, Memorial Blood Centers, a division of New York Blood Center enterprises</p> <p>Medical Director, Nebraska Community Blood Bank and Community Blood Center of Greater Kansas City</p> <p>Transfusion Service Medical Director, Hennepin County Medical Center (HCMC) & Children’s Hospitals and Clinics of Minnesota St. Paul, MN</p>
<p>Infectious Disease Screening – History and Present</p> <ul style="list-style-type: none"> Describe the evolution of infectious disease testing in the United States. Summarize the current state of pathogen reduction technologies. 	
<p>Requirements for Storage and Expiration</p> <ul style="list-style-type: none"> Describe the rationale for different storage requirements, by blood product. List shelf-life limits for commonly available blood products. <p><i>Note: “Transportation” will not be discussed.</i></p>	<p>Kathleen E. Puca, MD, MT(ASCP)SBB Senior Medical Director Versiti Wisconsin Milwaukee, WI</p>
<p>Principles of Blood Supply Safety</p> <ul style="list-style-type: none"> Explain the steps involved in blood donor qualification. Recognize the two priorities: donor and recipient safety. 	<p>Kevin Land, MD Vice President, Clinical Services Vitalant San Antonio, TX</p>
<p>Directed & Autologous Donors</p> <ul style="list-style-type: none"> Recognize the occasional medical need for directed blood donors. Name the different types of autologous donation. Describe situations where a certain type of autologous donation may be optimal. 	<p>Theresa A. Nester, MD Associate Medical Director Bloodworks Northwest Seattle, WA</p>
<p>Challenges in this Area</p> <ul style="list-style-type: none"> Paraphrase the challenges of protecting the iron stores of blood donors. Explain the challenges of managing blood inventory at the community level. Summarize the challenges of developing and supporting new blood products, such as whole blood and cold-stored platelets. 	<p>Justin Kreuter, MD Consultant and Instructor, Laboratory Medicine and Pathology Mayo Clinic Rochester, MN</p>

Topic 3: Transfusion Medicine Fundamentals

Subtopic & Learning Objectives	Presenter
<p>Blood Products and Indications on Why You Would Transfuse Each</p> <p><i>a. Describe the main blood products available for transfusion in the United States.</i></p> <ol style="list-style-type: none"> i. Red blood cells ii. Plasma iii. Platelets iv. Cryoprecipitate v. Whole blood (rarely used in the United States) <p><i>b. Detail the indications for red blood cell transfusion.</i></p> <ol style="list-style-type: none"> i. To provide oxygenation <p><i>c. Explain the indications for plasma transfusion</i></p> <ol style="list-style-type: none"> i. To replace coagulation factors in a bleeding/coagulopathic patient <p><i>d. Detail the indications for platelet transfusion</i></p> <ol style="list-style-type: none"> i. to treat/prevent mucosal bleeding in patients with low platelet counts (thrombocytopenic patients) <p><i>e. Describe the indications for cryoprecipitate transfusion</i></p> <ol style="list-style-type: none"> i. Main indication is to replace fibrinogen in a bleeding/coagulopathic patient; cryoprecipitate also contains coagulation factors VIII (8) and XIII (13), von Willebrand factor, and fibronectin 	<p>Kerry O'Brien, MD Medical Director, Blood Bank & Clinical Pathology Residency Program Director, Beth Israel Deaconess Medical Center Assistant Professor Pathology, Harvard Medical School Boston, MA</p>
<p>ABO Typing & Antibody Screening/Identification and Crossmatching – Why is This Important</p> <ol style="list-style-type: none"> a. Reveal the major ABO types and their prevalence in the donor and patient population b. Explain what a front (forward) and back (reverse) types is and how to perform it c. Describe the purpose of the antibody screen <ol style="list-style-type: none"> i. Explain why group O cells are always used in an antibody screen ii. Describe two cell versus three cell screens d. Explain the purpose of antibody identification e. Describe what a crossmatch is <ol style="list-style-type: none"> i. Explain the differences between immediate spin, full serological (AHG) and electronic crossmatch 	<p>Adam Norfolk, MBA, MLS(ASCP)^{CM}SBB^{CM} Lead Technologist Blood Bank Beth Israel Deaconess Medical Center Boston, MA</p>
<p>Sequencing (Vein to Vein Pipeline) - Where is Activity Occurring and What Sequence</p> <p><i>a. Detail the steps the transfusionist must take prior to transfusion of blood products</i></p> <ol style="list-style-type: none"> a. Compatibility <ol style="list-style-type: none"> i. Describe the compatibility chart when transfusing red blood cells. ii. Detail the compatibility chart when transfusing plasma. iii. Detail the compatibility chart when transfusing whole blood. 	<p>Melanie Jorgenson, RN, BSN, LSSGB Client Delivery Lead, Clinical Optimization Accumen Seattle, WA</p>

<p>Adverse Effects of Blood Transfusion</p> <ol style="list-style-type: none"> a. Review the latest SHOT and FDA data as a framework b. Detail the main infectious risks of blood transfusion c. Explain the non-infectious adverse effects of transfusion <ol style="list-style-type: none"> i. Detail the acute transfusion reaction types <ol style="list-style-type: none"> 1. Allergic <ol style="list-style-type: none"> a. Mild - moderate b. Anaphylactic 2. Acute hemolytic 3. Febrile non-hemolytic 4. Transfusion associated circulatory overload (TACO) 5. Transfusion related acute lung injury (TRALI) 6. Acute hypotensive ii. Describe the delayed transfusion reaction types <ol style="list-style-type: none"> 1. Delayed hemolytic 2. Delayed serologic 3. Transfusion associated graft versus host disease (TA-GVHD) 4. Post-transfusion purpura (PTP) 5. Iron overload iii. Reveal the most common acute transfusion reactions <ol style="list-style-type: none"> 1. Allergic 2. Febrile non-hemolytic 3. Transfusion associated circulatory overload (TACO) 	<p>Kerry O'Brien, MD Medical Director, Blood Bank & Clinical Pathology Residency Program Director, Beth Israel Deaconess Medical Center Assistant Professor Pathology, Harvard Medical School Boston, MA</p>
<p>Challenges in this Area</p> <ul style="list-style-type: none"> • Discuss how this highly regulated industry is dependent on regulatory bodies – constantly changing to meet requirements. • Discuss important factors with providing individualized treatment/care. • Identify challenges with educating ordering providers/clinical staff. 	<p>Richard L. Haspel, MD, PhD Medical Director, Stem Cell Processing Laboratory Associate Professor of Pathology Beth Israel Deaconess Medical Center Harvard Medical School Boston, MA</p>

Topic 4: Regulatory/Compliance Deep Dive

Subtopic & Learning Objectives	Presenter
<p>Regulatory Bodies</p> <ul style="list-style-type: none"> Define and distinguish the regulatory agencies that oversee transfusion services (AABB, FDA, CMS, State, CAP). Describe the requirements of all applicable regulatory and accrediting agencies. Explain the difference between regulatory oversight and voluntary accreditation. 	<p>Anne Chenoweth, MBA, MT(ASCP)CM, CQA(ASQ) Senior Director, Accreditation & Quality AABB Bethesda, MD</p>
<p>Report (What and Why)</p> <ul style="list-style-type: none"> Explain why the manufacturers of blood and blood components have to report errors and accidents in the manufacture to the FDA. Describe what is a deviation that must be reported to the FDA. Discuss why the manufacture of blood and blood components is subject to the reporting of errors and fatalities to the FDA. 	<p>Sharon Carayiannis, BSMT(ASCP)HP Director, Regulatory Affairs AABB Bethesda, MD</p>
<p>Special Requirements for Facilities and Safety</p> <ul style="list-style-type: none"> Describe the unique requirements for computer systems in hospitals and blood centers. Define and explain the organizations that provide oversight and standards for computer use. Describe the unique issues with cybersecurity in the medical laboratory and blood centers. 	<p>Lynne B. Briggs Vice President & Chief Information Officer Versiti Milwaukee, WI</p>
<p>Irradiation</p> <ul style="list-style-type: none"> Explain the need for irradiation of blood and blood components. Discuss the role of the Nuclear Regulatory Administration in the clinical laboratory. Describe the process of irradiation and the standards that provide oversight. 	<p>AABB 11/05/19 On-Demand eCast: Replace Your Cesium Irradiator the Easy Way; Financial Incentives, Logistics, Transition Strategies</p>
<p>Roles of the Players & Groups</p> <ul style="list-style-type: none"> Identify the different professionals in laboratory medicine. Identify the credentialing bodies for the clinical laboratory. Describe the future state of the clinical laboratory medicine field. Explain the requirements for laboratory personnel found in the US Federal Regulations. 	<p>Anne Chenoweth, MBA, MT(ASCP)CM, CQA(ASQ) Senior Director, Accreditation & Quality AABB Bethesda, MD</p>
<p>Challenges in this Area</p> <ul style="list-style-type: none"> Discuss the workforce shortage and the challenges this poses. Describe the training and cost of training of the new workforce. Explain how Artificial Intelligence (AI) and other technologies will impact laboratory medicine. 	

**Titles and affiliations at the time of program development and recording.*