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Preparing for the American Board of Pathology (ABPath) Examination of Fundamental Knowledge and Skills

Blood Banking/Transfusion Medicine

Content Specifications

Overview:

Blood Banking/Transfusion Medicine Content Specifications

This guide outlines the content that may appear on the American Board of Pathology Blood Banking/Transfusion Medicine Subspecialty exam. It provides a framework based on the knowledge and skills typically covered in Fellow-level training, along with applicable Core and Advanced Resident topics from residency training that the trainee is expected to know or be able to perform.

Key to Designations:

C = Core/Foundational Knowledge

AR = Advanced Resident Knowledge

F = Fellow/Advanced Practitioner Knowledge

The exam assesses the knowledge, judgment, skills, and abilities necessary to identify specific entities, properly process specimens, and diagnose and monitor diseases using methods common in the practice of Blood Banking/Transfusion Medicine. The specific diseases, tests, and concepts listed in this document are important for candidates to know, but it is not possible to create a fully comprehensive list of all the material needed for certification and effective practice. Candidates should use this guide as a reference for preparing for certification and professional practice.

Contents

1. Clinical Practice

a. Autoimmune Hemolytic Anemia	
i. Classification, Epidemiology, and Causes	C
ii. Warm Autoimmune Hemolytic Anemia	AR
1. Pathophysiology	AR
2. Autoantibodies	AR
3. Clinical Features	AR
4. Laboratory Features	AR
5. Treatment/Transfusion	AR
6. Treatment/Pharmacologic	F
iii. Cold Hemagglutinin Disease	AR
1. Pathophysiology	AR
2. Autoantibodies	AR
3. Clinical Features	AR
4. Laboratory Features	AR
5. Treatment/Transfusion	AR
6. Treatment/Pharmacologic	F
iv. Paroxysmal Cold Hemoglobinuria	AR
1. Pathophysiology	AR
2. Autoantibodies	AR
3. Clinical Features	AR
4. Laboratory Features	AR
5. Treatment/Transfusion	AR
6. Treatment/Pharmacologic	F
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2. Drug-Adsorption Mechanism	F
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c. Anemia in Oncology Patients	C

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5. Passive Alloimmune Thrombocytopenia	F
6. Transplantation-Associated Alloimmune Thrombocytopenia	F
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b. Solid Organ Transplantation	F
e. Bleeding from Congenital and Acquired Coagulation Defects, and Antithrombotic Therapy	
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2. Laboratory Features	C
3. Management of Bleeding	C
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2. Hemorrhagic Disease of the Newborn	C
3. Other Causes of Vitamin K Deficiency	C
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3. Laboratory Features	C
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3. Acquired von Willebrand Syndrome	F
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iii. Donor Stimulation – Corticosteroids and G-CSF	F
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vi.	Product Selection – Special Needs	F
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ii.	Class I and II Antigens and Their Function	AR
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2.	Disease Association	F

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	1. Regulation of Production	C
	2. Interaction with- and Effects on Erythroid Progenitor Cells	C
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iii. Molecular Basis for Rh Antigen Expression		AR
	1. D Antigen	AR
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	b. Hemolytic Disease of the Fetus and Newborn	AR
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ii. The Surgical Patient	C
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g. Oversight	AR
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1. Mathematic Principles	AR
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7. Stiff-Person Syndrome	F
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ii. Signs and Symptoms	C
iii. Complications	C
iv. Causes	C
v. Differential Diagnosis	C
vi. Laboratory Investigation	C
vii. Pathophysiology	C
viii. Treatment	C
ix. Prevention	C
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2. Causes	C
3. Diagnosis	C
4. Treatment	C
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2. Causes	C
3. Diagnosis	C
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5. Prevention	C
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3. Diagnosis	C
4. Treatment	C
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2. Autologous Transfusion		AR
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2. Malignancies		AR
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viii. Treatment		AR
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ii. Iron Burden of Transfusions		AR
iii. Clinical Features		AR
iv. Measurement of Iron Burden		AR
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1. Goals		AR
2. Chelation Therapy		AR
e. Transfusion-Related Acute Lung Injury		C
i. Incidence and Epidemiology		C
ii. Clinical Features		C
iii. Pathophysiology		C
1. Acute Lung Injury-Features		C
2. Causes		C
3. Mechanisms of Lung Damage		C
4. Multiple Hit/Threshold Theory		C
iv. Diagnosis and Differential Diagnosis		C
1. Clinical, Physiologic, Radiologic, & Laboratory Features		C
2. Consensus Definition		C
v. Treatment and Management		C
vi. Donor Investigation		C
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i. Pathophysiology and Clinical Features	AR
ii. Treatment	AR
g. Transfusion-Associated Dyspnea	C

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a. Plasma Composition	
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iii. Immunoglobulins	C
iv. von Willebrand Factor Cleaving Protease	AR
v. Coagulation Factors, Coagulation Factor Inhibitors, and von Willebrand Factor (e.g., description, half-life)	AR
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i. Plasma Products – Indications and Clinical Use	C
1. Prothrombin Complex Concentrate (PCC)	C
ii. Adverse Effects	C
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v. Plasma Manufacture	F
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vii. Recombinant DNA Technology and Manufacturing	F
1. Recombinant Factor VIIa	F
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1. Manufacture and Features	AR

2. Clinical Use, Indications, and Guidelines for Use		AR
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iv. Rh Immune Globulin		AR
1. Manufacture and Features		AR
2. Clinical Use, Indications, and Guidelines for Use		AR
3. Risks and Adverse Effects		AR
v. IVIG		AR
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2. Clinical Use, Indications, and Guidelines for Use		AR
3. Risks and Adverse Effects		AR
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ii. Hepatitis B Virus	C
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2. Transmission	C
3. Clinical Features	C
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b. Chronic Infection	C
4. Serologic and Molecular Markers of Infection	C
5. Donor Testing and Counseling	C
6. Prevention	C
7. Treatment	C
iii. Hepatitis C Virus	C
1. Epidemiology	C
2. Transmission	C
3. Clinical Features	C
a. Acute Infection	C
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iv. Hepatitis A Virus	F
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2. Transmission	F
3. Clinical Features	F
4. Donor Testing and Counseling	F
5. Prevention	F
6. Treatment	F

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	2. Diagnosis	F
	3. Transmission	F
	4. Clinical Features	F
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	2. Incidence and Prevalence Among Blood Donors	C
	3. Window Period and Risk of Transmission	C
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	5. Clinical Features	C
	6. Prevention	C
	7. Treatment	C
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	2. Incidence and Prevalence Among Blood Donors	F
	3. Window Period and Risk of Transmission	F
	4. Donor Testing and Counseling	F
	5. Clinical Features	F
	6. Prevention	F
	7. Treatment	F
c. Cytomegalovirus (CMV)		
	1. General Information and Epidemiology	C
	2. Incidence and Prevalence Among Blood Donors	C
	3. Clinical Features	C
	4. Prevention	C
	5. Treatment	C
	6. Window Period and Risk of Transmission	AR
	7. Donor Testing and Counseling	AR
d. Other Viruses		
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ii. West Nile Virus		AR
	1. General Information and Epidemiology	AR
	2. Transmission	AR
	3. Donor Testing and Counseling	AR
	4. Clinical Features	AR
	5. Prevention	AR
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	2. Transmission	F

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696	2. Transmission	AR
697	3. Donor Testing and Counseling	AR
698	4. Clinical Features	F
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700	ii. Malaria	
701	1. General Information and Epidemiology	AR
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703	3. Donor Testing and Counseling	AR
704	4. Clinical Features	F
705	5. Prevention	F
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708	2. Transmission	AR
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711	5. Prevention	F
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727	4. Treatment	AR
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729	vi. Strategies to Reduce the Risk of Posttransfusion Sepsis	AR
730	1. Donor Screening	AR
731	2. Skin Preparation	AR
732	3. Diversion	AR
733	4. Apheresis versus Whole Blood-Derived Platelets	AR
734	5. Storage Time and Temperature	AR

6. Bacterial Detection AR
7. Bacterial Elimination AR
8. Syphilis AR

g. Prion Diseases F
i. General Information and Epidemiology F
ii. Transmission F
iii. Clinical Features F
iv. Risk Management – Donor Selection F
v. Blood Component Processing F
vi. Plasma Derivative Manufacture F
vii. Cellular, Tissue, and Organ Transplantation F

h. Pathogen Inactivation
i. Overview and Description AR
ii. Plasma
1. Psoralen Ultraviolet Light Treatment C
2. Solvent/Detergent Treatment AR
3. Methylene Blue Light Treatment AR
4. Riboflavin Light Treatment AR
iii. Platelets
1. Psoralen Ultraviolet Light Treatment C
2. Riboflavin Light Treatment AR
3. Thionine Light Treatment AR
iv. Red Cells F
1. Alkylating Agents F
2. Photosensitizers F
3. Riboflavin Light Treatment F
v. Emerging Technologies F

9. Blood Donors and Blood Collection

a. Recruitment and Screening of Donors and the Collection, Processing and Testing of Blood
i. Organization of Blood Services
1. United States C
2. Outside the United States F
ii. Blood Donor Recruitment AR
iii. Collection Process
1. Donor Evaluation AR
a. Consent AR
b. History & Physical Examination AR
c. Laboratory Testing AR
d. Deferral Criteria AR
2. Blood Collection AR
a. Whole Blood AR

b. Component Separation	AR
c. Leukocyte Reduction	AR
d. Automated Collection	AR
3. Blood Component Testing	AR
a. ABO/Rh	AR
b. Antibody Screening	AR
c. Infectious Disease	AR
4. Distribution	AR
5. Source Plasma	AR
iv. Blood Donor Adverse Events	
1. Donor Reactions	AR
a. Categories	AR
b. Incidence	AR
c. Clinical Features	AR
d. Risk Factors	AR
e. Treatment	AR
f. Prevention	AR
2. Phlebotomy-Related	AR
a. Categories	AR
b. Incidence	AR
c. Clinical Features	AR
d. Risk Factors	AR
e. Treatment	AR
f. Prevention	AR
3. Long-Term Effects of Donation	F
a. Iron	F
b. Platelets	F
c. Plasma Proteins	F

10. Surgery Patients

a. Alternatives to Transfusion: Perioperative Blood Management	AR
i. Preoperative	AR
1. Autologous Blood Donation	AR
2. Anemia Optimization	AR
a. Iron	AR
b. Erythropoietin	AR
ii. Intraoperative/Postoperative	AR
1. Acute Normovolemic Hemodilution	AR
2. Intraoperative Autologous Blood Recovery and Reinfusion (Cell Salvage)	AR
3. Postoperative Autologous Blood Recovery and Reinfusion	AR
b. Hemostasis for Surgery/Invasive Procedures	
i. Preprocedure Blood Components	

1. Common Laboratory Tests of Hemostasis and Their Relationship with Procedure-Related Bleeding C
2. Procedure-Related Bleeding
   a. Central Venous Catheter AR
   b. Liver Biopsy AR
   c. Thoracentesis and Paracentesis AR
   d. Gastrointestinal Endoscopy and Biopsy AR
   e. Procedures on Upper Airway, Bronchoscopy, and Transbronchial Lung Biopsy AR
   f. Renal Biopsy AR
   g. Epidural Anesthesia, Lumbar Puncture, and Neurosurgical Procedures AR
   h. Angiography AR

ii. Treatment of Bleeding F
1. Local F
   a. Physical – Sutures, Electrocautery, Compression, Direct Packing, etc. F
   b. Topical Agents F
   c. Topical Sealants F
   d. Topical Thrombin F
   e. Topical Antifibrinolytics F
2. Generalized F
   a. Skin and Membrane F
   b. Purpura and Soft Tissue F
   c. Small Vessel Bleeding During Surgery F
   d. DDAVP F

c. Transfusion Therapy for Trauma and Burn Patients
i. Shock
1. General Information and Definition C
2. Hemorrhagic Shock and Classification C
   a. Acidosis C
   b. Hypothermia C
   c. Coagulopathy C
3. Trauma Patient
   a. Initial Resuscitation
      a. Damage Control C
      b. Blood Component Therapy C
      c. Hemostatic Agents AR
      d. Pharmacologic Agents AR
   b. Intraoperative
      a. Blood Component Therapy C
      b. Damage Control AR
      c. Temperature AR
      d. Autotransfusion AR

e. Solid Organ Injury	AR
f. Hemostatic Agents	AR
g. Pharmacologic Agents	AR
c. Recovery Phase	C
a. Blood Component Therapy	C
d. Massive Transfusion	C
a. Definition	C
b. Blood Component Therapy	C
c. Complications	C
4. Patients with Thermal Injuries (Burns)	F
a. Initial Resuscitations	F
a. Fluid Therapy	F
1. Colloid	F
2. Crystalloid	F
b. Transfusion Therapy	F
c. Hemostatic Agents	F
d. Pharmacologic Agents	F
d. Transfusion Therapy in Solid Organ Transplantation	
i. Organ Procurement and Transplants	F
ii. Immunologic Barriers – ABO and HLA	AR
a. Across Immunologic Barriers	AR
b. Organ Selection	AR
c. Plasma Exchange	F
d. Pharmacologic Agents	F
iii. Immunohematology	AR
a. Patient Alloantibodies	AR
b. Passenger Lymphocyte Antibodies	AR
iv. Transfusion Therapy	AR
a. Liver	AR
b. Heart	AR
c. Lung	AR
d. Kidney	AR
e. Pancreas	AR
f. Other	AR
v. Special Needs	AR
a. CMV Low Risk	AR
b. Leukocyte Reduction	AR
c. Irradiation	AR

11. Biovigilance and Transfusion-Related Immunomodulation

a. Biovigilance/Hemovigilance	F
i. Requirements for Effective Program	F
ii. Scope	F
1. Reporting Criteria	F

a. Adverse Reactions	F
b. Adverse Incidents	F
c. Near Misses	F
2. Biovigilance	F
a. Passive Reporting versus Active Surveillance	F
b. Traceability	F
3. Blood Donors	F
4. Transfusion Recipients	F

12. Platelets

a. Platelet Production (Thrombopoiesis)	C
i. Megakaryocyte Development, Maturation, and Differentiation	C
ii. Thrombopoietic/Megakaryocyte/Hematopoietic Growth Factors	C
iii. Genetic and Cellular Regulation of Thrombopoiesis	C
iv. Platelet Production, Shedding, and Release	C
b. Platelets and Hemostasis	C
i. Normal Platelet Plug and Clot Formation	C
ii. Genetic/Congenital Platelet Disorders	C
iii. Acquired Platelet Disorders	C
c. Platelet Transfusions	
i. Collection and Storage of Platelet Preparations/Concentrates	C
ii. Clinical Platelet Transfusions (Indications, Dose, and Schedule)	C
iii. Alternatives to Platelet Transfusions (Thrombopoietic & Pharmacologic Agents)	AR
d. Platelet Immunity	AR
i. Platelet Antigens (ABO, HLA, Platelet Specific)	AR
ii. Disorders of Platelet Alloimmunization	AR
iii. Platelet Autoimmunity	AR
e. Platelets in the Bloodstream	AR
i. Platelet Circulation, Distribution, and Destruction	AR
ii. Platelet Survival Kinetics in Health and Disease	AR

13. Neutrophils

a. Neutrophil/Granulocyte Transfusions – Primary Clinical Issues	AR
i. Neutrophil Collection, Storage, and Transfusion	AR
ii. Alternatives to Neutrophil Transfusions (Myelopoietic Factors)	AR

14. Intravascular Cell Kinetics **F**

a. Concepts of Post-Transfusion Recovery and Tracking Labeled/Tracer Cells	F

15. Obstetric and Pediatric Patients

a. Hemolytic Disease of the Fetus and Newborn	
i. ABO Incompatibility	C
ii. Rh(D) and Other Fetal-Maternal RBC Incompatibilities	C

iii. Management	AR
1. Diagnostic and Surveillance Tests	AR
2. Fetal and Neonatal Transfusions, Phototherapy, IVIG, etc	AR
b. Obstetric Transfusion Practices	AR
i. Maternal Hematologic Disorders During Pregnancy	AR
ii. Maternal Hemorrhagic and Transfusions During Pregnancy	AR
iii. Fetal (Intrauterine) Transfusions	AR
c. Congenital Disorders of Clotting and Anticoagulant Protein	
i. Developmental Physiology of Plasma Proteins	C
ii. Hemophilia A, B, and von Willebrand Disease	
1. Pathophysiology and Treatment	C
2. DDAVP	C
3. Congenital Disorders of Non-Hemophilia Clotting Proteins	F
4. Congenital Disorders of Anticoagulant/Prothrombotic Proteins	F
d. Congenital Hemoglobinopathies and Hemolytic Anemias	
i. Sickle Cell Disease (Pathophysiology and Treatment)	C
ii. Non-Sickle Cell Hemoglobinopathies	C
iii. Thalassemias (Pathophysiology and Treatment)	C
iv. Congenital Red Cell Membrane and Enzyme Defects	AR
e. Neonatal Transfusions	
i. Anemia of Prematurity (Pathophysiology and Treatment)	C
ii. Thrombocytopenia of Prematurity (Pathophysiology and Treatment)	C
iii. Neonatal Blood Banking Practices (Dedicated Units, WBC-Reduction, Irradiation, etc.)	AR
iv. Neonatal/Infant Plasma, Cryoprecipitate, and Neutrophil Transfusions	AR

16. Hematopoietic Progenitor Cell (HPC) Transplantation

a. Biology of Marrow Transplantation	
i. Autologous	AR
ii. Allogeneic/Syngeneic	AR
iii. Indications, Methods, Results, and Adverse Effects	F
b. Biology of HPC and HPC Transplantation	
i. HLA Typing for HPC Transplantation	AR
ii. HPC Biology	F
iii. Identification and Measurement of HPC	F
iv. Allogeneic/Syngeneic Donor Selection, Quantification, Eligibility	F
v. Processing Requirements for HPC	F
1. General	F
2. Patient-Specific	F
vi. Regulatory, Compliance, and Accreditation	F
c. HPC Sources and Collection	AR
i. HPC Apheresis – Characteristics and Adverse Effects	AR

1. Biology of Stem Cell Mobilization		AR
2. Apheresis Consideration		
a. Techniques, Vascular Access, Donor Management, and Adverse Events (Allogeneic vs. Autologous)		AR
3. Mobilization Regimens		
a. Indications, Dose, Schedule, Efficacy, and Adverse Effects		F
	Chemotherapy	F
	Growth Factors – G-CSF, GM-CSF	F
	Adhesion Blockers-Plerixafor	F
b. Scheduling Mobilization and Apheresis Collection		F
c. Monitoring Mobilization and HPC Collection		F
d. Collection of Lymphocytes for Infusion (Donor Lymphocyte Infusion [DLI])		F
4. Scheduling Mobilization and Apheresis Collection		F
ii. HPC-Marrow		F
1. Methods of Harvesting		F
2. Characteristics		F
3. Adverse Effects		F
iii. HPC Cord Blood		
1. Characteristics and Methods		F
a. Cord Blood Banking Donor Eligibility, Collection Methods, Processing, Testing, and Cryopreservation		F
b. Cord Blood Characteristics		F
c. Donor Selection for Transplant (Related and Unrelated)		F
iv. Selection of Appropriate HPC Source for a Given Patient		F
d. HPC Processing – Goals, Guidelines, and Methods (Preparation for Infusion)		F
i. HPC for Autologous Transplants		F
ii. HPC for Allogeneic Transplants		F
1. Indications for Plasma, RBC Reduction		F
iii. Preparation for Cells for Donor Lymphocyte Infusion		F
iv. Cord Blood		F
v. Processing of Other CT Products (e.g., Antigen-Directed T-cells, Marrow Stromal Cells)		F
e. HPC Storage and Preservation		F
i. Liquid Storage and Transport -Anticoagulant, Time, Temperature, Preservative, Cell Concentration		F
ii. Rationale for Cryopreservation		F
iii. Cryopreservation Theory and Practice		F
1. Cryoprotectants		F
2. Cryopreservation Techniques -Controlled Rate, “Dump Freeze”		F

	3. Storage -Mechanical and Liquid Nitrogen (Vapor vs. Liquid)	F
f.	Management of RBC Antigen Incompatibility in Allogeneic Transplantation	
	i. Patient Transfusion Management	AR
	1. Major or Minor ABO Incompatibility	AR
	a. Immediate vs. Delayed Hemolysis	AR
	2. Passenger Lymphocyte Syndrome (PLS)	AR
	a. Cause, Diagnosis, Course, Therapy, Prevention	AR
	ii. Graft Management	F
	-Depletion of RBC (Major), Plasma (Minor)	F
g.	HPC Assessment – Pre- and Post-Processing and Post Thaw	F
	i. Cell Counts and Methods	F
	ii. HPC Measurement and Enumeration	F
	1. Flow Cytometry	F
	2. Non-Flow Methods	F
	iii. HPC Viability Assessment Techniques	F
	iv. HPC Cell Culture Assays	F
	v. HPC Functional and Differentiation Assays	F
	vi. HPC Microbial Assessment	F
	1. Gram Stain and Cultures	F
h.	Cell Selection Methods and Applications	F
	i. Positive and Negative Selection	F
	1. Techniques, Results, Indications	F
	ii. CD34 Cells and Others (e.g., Treg)	F
	iii. Tumor Purging and T-cell Depletion	F
i.	HPC and CTP Thawing and Post-Thaw Processing	
	i. (Apheresis, Marrow, Cord Blood, etc.)	F
	ii. Direct HPC Infusion vs. Pre-Infusion Cell Washing	F
	iii. Special Considerations for Preparation of Cord Blood HPC for Infusion	F
j.	HPC and CTP Infusion	F
	i. General Guidelines	F
	1. Filters, No Irradiation, Infusion Rate DMOS Limits, Infusion Pumps	F
	ii. Adverse Effects and Infusion Reactions	
	1. Incidence, Causes, Diagnosis, and Management	F
	iii. Management and Infusion of Contaminated Products	F
k.	Engraftment	
	i. Definition, Chimerism, Relationship to CD34+ Cell Doses	F
	ii. Rates – Autologous vs. Allogeneic, Related vs. MUD, HPC Source, Conditioning	F
	iii. Engraftment Failure – Causes and Management	F
	iv. Immune Reconstitution Post-Transplant	F
	v. Donor Lymphocyte Infusion – Rationale, Efficacy	F
l.	HPC Laboratory Quality Assurance and Accreditation	F

i.	AABB, FACT, CAP, NMDP	F
ii.	Regulatory Considerations	F
	Federal GMP, GTP, State Supplies, Laboratory Development, Deviations, Non-Conforming HPC and CTP	F
m.	Laboratory Administration	
i.	Staff Hiring and Training	F
ii.	Facilities	F
iii.	Equipment and Supplies	F
iv.	Laboratory Development	F
v.	Deviations, Non-Conforming HPC and CTP	F
n.	Experimental Cell Therapies	
i.	Institutional vs. Commercially Sponsored	F
ii.	Types (e.g., Marrow Stromal, Adoptive Therapy with T-cells, Genetically-Modified Cells)	F
iii.	Special Requirements for Processing (Clean Room, etc.)	F
iv.	Regulatory Considerations	F

17. Blood Bank/Transfusion Medicine-Specific Administration and Laboratory Management

a.	Current Legal Issues	
i.	Blood Transfusion Injury Claims	
1.	Informed Consent	C
2.	Blood Shield Laws	F
3.	Negligence	F
4.	Standard of Care	F
5.	Causation	F
ii.	HIPAA Privacy Rule	C
iii.	Donor Injury	F
iv.	Cord Blood	F
v.	Tissue Banking	F
b.	Current Good Manufacturing Practice	
i.	General Overview	C
ii.	Licensing Products and Establishments	AR
iii.	Recalls and FDA Enforcement Activities	AR
iv.	Safety Initiatives	AR
v.	Enforcement Options	AR
vi.	Rationale	AR
1.	Standard Operating Procedures	AR
2.	Record Keeping	AR
3.	Personnel and Training	AR
4.	Calibration	AR
5.	Validation	AR
6.	Labeling	AR
7.	Error Management	AR

8. Quality Control Unit and Internal Audits	AR
9. Facilities and Equipment	AR
10. Process and Production Controls	AR
vii. Information Management	AR
viii. Common Violations	AR
c. Hospital Transfusion Services, Transfusion Committee, and Quality Assurance	
i. Role of the Medical Director	AR
1. Administrative	AR
2. Clinical	AR
3. Education	AR
ii. Quality Assurance	AR
1. Process Control	AR
2. Error Management	AR
3. Improving Transfusion Practice	AR
iii. Regulatory and Accreditation Requirements	AR
1. Food and Drug Administration	AR
2. AABB	AR
3. Joint Commission	AR
4. College of American Pathologists	AR
iv. Transfusion Committee	AR
1. Membership	AR
2. Functions	AR
3. Oversight of Transfusion Policies, Procedures and Guidelines	AR
4. Education	AR
v. Other Administrative Issues	AR
d. Transplant Organizations and Networks in the Regulation of Cellular and Tissue Therapy Programs	
i. Hematopoietic Progenitor Cells	F
1. Sources	F
2. Indications	F
3. HLA Matching	F
4. Donor Registries and Networks, Outcomes Registries, Professional Associations and Networks	F
5. Accreditation Organizations	F
ii. Other Cellular Therapies	F
1. Organizational Aspects	F
2. Accreditation and Regulation	F
iii. Tissue Banks	F
1. Organizational Aspects	F
2. Accreditation and Regulation	F