
Table of Contents

Preface	xiii
About the Editor	xv
1. Donor Apheresis Separators and Their Development	1
<i>Daniel D. Summerfield, MD, and Edwin A. Burgstaler, MT, HP(ASCP)</i>	
Early History	2
Principles of Operation	4
Approaches Over Time.....	5
Current Instrumentation.....	8
Comparison of Current Apheresis Systems	26
Summary	32
Suggested Readings	32
2. Physiology of Donor Apheresis and Donor Reactions	33
<i>P. Dayand Borge, MD, PhD, and Leonard N. Chen, MD, PhD</i>	
Anticoagulation	34
Fluid Shifts.....	42
Platelet Loss and Lymphocyte Depletion	43
Adverse Effects.....	45
Suggested Readings	48
3. Selection and Care of the Apheresis Donor	51
<i>Eileen Galvin Karr, RN, BSN, HP(ASCP)QIA, and Antonia Hagen-Coonrad, RN,BSB</i>	
Donor Recruitment, Education, and Conversion	52
Staff Training.....	54
Donation Eligibility	54
TRALI Mitigation.....	56
Emerging Infectious Diseases	56
Donor Comfort and Venipuncture.....	57
Apheresis Equipment and Donor Care.....	59
Granulocyte Donors	59
Suggested Readings	61

4.	Automated Red Cell Donations: Double Red Cell and Multicomponent Donor Procedures	63
	<i>Laura Infanti, MD, MSc</i>	
	Development of and Instrumentation for Double-Dose RBC and Multicomponent Collections	65
	Quality of RBCs from Double-Dose RBC and Multicomponent Collection	68
	Regulatory Considerations for Apheresis RBC, Plasma, and Multicomponent Donations	70
	Donor Acceptance, Adverse Events, and Iron Loss	73
	Implementation of Multicomponent and Double-Dose RBC Collection by Apheresis	76
	Trends in RBC Collection by Apheresis	78
	Particular Applications of Automated RBC Collections	79
	Suggested Reading	79
5.	Automated Plasma Collection: Infrequent and Frequent Plasma Donation	81
	<i>Jonathan Hughes, MD</i>	
	Clinical Use of Plasma	82
	Technical Aspects of Plasma Donation by Apheresis	88
	Plasma Donation Programs	89
	Suggested Readings	92
6.	Apheresis Platelet Content, Storage, Quality Assessment, and Modifications	95
	<i>Salima Shaikh, MD, and Ralph R. Vassallo, Jr, MD, FACP</i>	
	Patient and Donor Platelet Kinetics	96
	Platelet Transfusion Dose	98
	Liquid Storage of Platelets in Plasma	100
	Liquid Storage of Platelets in Platelet Additive Solution	105
	Cold-Stored Platelets	105
	Assessing Platelet Quality	107
	Component Modification	110
	Conclusions	112
	Suggested Readings	112
7.	Provision of Apheresis Platelet Transfusions: Patient and Producer Perspectives	115
	<i>Thomas J. Gniadek, MD, PhD, and Claudia S. Cohn, MD, PhD</i>	
	Usage Trends	116
	Characteristics of Apheresis and Pooled Platelets	117
	Advantages and Disadvantages of Apheresis Platelets	120
	Suggested Reading	125

Table of Contents

8. Bacterial Contamination of Platelet Products	127
<i>Stephen J. Wagner, PhD</i>	
Clinical Presentation of Septic Transfusion Reactions	129
Organisms and Sources	130
Methods to Reduce the Risk of Transfusion-Associated Sepsis.	131
Conclusion	138
Suggested Readings	138
9. Pathogen Inactivation Technologies for Blood Components	141
<i>Cyril Jacquot, MD, PhD; Burak Bahar, MD; and Meghan Delaney, DO, MPH</i>	
Decreasing the Risk of Transfusion-Associated Sepsis	142
Overview of Pathogen Inactivation.	143
Pathogen Reduction/Inactivation Methodologies.	143
Efficacy against Pathogens and Limitations	148
Clinical Effectiveness of Platelets after PI Treatment	149
Special Considerations for Pediatric Use	149
Effect of PRT on Collection, Storage, Quality, and Cost	150
Ongoing Monitoring of PI for Effectiveness and Adverse Events	153
Plasma PI and Its Effects	153
Future Directions	154
Suggested Readings	154
10. HLA-Compatible Platelets	157
<i>Roger Belizaire, MD, PhD, and Robert S. Makar, MD, PhD</i>	
HLA Alloimmunization and Platelet Transfusions	158
ABH and Platelet-Specific Antigens and Platelet Transfusion.	160
Diagnosis of Alloimmune Refractoriness.	164
Matched Platelets in the Management of the Alloimmunized Patient.	166
Other Approaches to the Management of Thrombocytopenia and Persistent Platelet Transfusion Refractoriness	171
The HLA-Typed Donor Pool in a Matched Donor Program.	171
Suggested Readings	172
11. Granulocyte (Neutrophil) Transfusion.	175
<i>Corinne Goldberg, MD, and Jeffrey McCullough MD</i>	
Neutrophil (PMN) Physiology	176
Clinical Indications for Granulocyte Transfusions	177
Clinical Experience with Granulocyte Transfusions	177
Clinical Efficacy	177
Experience with Neonates and Pediatric Patients.	181
Transfusion Guidelines	182
Granulocyte Transfusion-Associated Adverse Reactions.	182
Technical Considerations: Donor Granulocyte Collection and Manufacture	183

Apheresis Principles and Practice

Future of Granulocyte Transfusions	185
Suggested Readings	186
12. Quality Management in Apheresis.	189
<i>Eric Senaldi, MD</i>	
Background	190
Employee Categories and Roles	192
Employee Preparation	195
Management of the Apheresis Unit—Operations	196
Management of the Apheresis Unit—Quality Systems	198
Minimum Quality System Elements	199
Suggested Readings	210
Index	213