Contents

List of Contributors ix
Preface xv

1 Introduction: Two Centuries of Progress in Transfusion Medicine 1
Walter H. (Sunny) Dzik and Michael F. Murphy

Part I Basic Principles of Immunohaematology 11

2 Essential Immunology for Transfusion Medicine 11
Jaap Jan Zwaginga and S. Marieke van Ham

3 Human Blood Group Systems 20
Geoff Daniels

4 Human Leucocyte Antigens 29
Cristina V. Navarrete and Colin J. Brown

5 Platelet and Neutrophil Antigens 43
Brian R. Curtis

6 Pretransfusion Testing and the Selection of Red Cell Products for Transfusion 58
Mark H. Yazer and Meghan Delaney

Part II Complications of Transfusions 69

7 Investigation of Acute Transfusion Reactions 69
Kathryn E. Webert and Nancy M. Heddle

8 Haemolytic Transfusion Reactions 81
Edwin J. Massey, Robertson D. Davenport and Richard M. Kaufman

9 Febrile and Allergic Transfusion Reactions 97
Mark K. Fung and Nancy M. Heddle
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Lung Injury and Pulmonary Oedema After Transfusion</td>
<td>108</td>
</tr>
<tr>
<td></td>
<td>Steven H. Kleinman and Daryl J. Kor</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Purported Adverse Effects of ‘Old Blood’</td>
<td>118</td>
</tr>
<tr>
<td></td>
<td>Lirong Qu and Darrell J. Triulzi</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Transfusion-Induced Immunomodulation</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>Amy E. Schmidt, Majed A. Refaai, Joanna M. Heal and Neil Blumberg</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Transfusion-Associated Graft-Versus-Host Disease and Microchimerism</td>
<td>136</td>
</tr>
<tr>
<td></td>
<td>Beth H. Shaz, Richard O. Francis and Christopher D. Hillyer</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Posttransfusion Purpura</td>
<td>147</td>
</tr>
<tr>
<td></td>
<td>Michael F. Murphy</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Transfusion-Transmitted Infections</td>
<td>153</td>
</tr>
<tr>
<td></td>
<td>Roger Y. Dodd and Susan L. Stramer</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Bacterial Contamination</td>
<td>168</td>
</tr>
<tr>
<td></td>
<td>Sandra Ramírez-Arcos and Mindy Goldman</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Emerging Infections and Transfusion Safety</td>
<td>176</td>
</tr>
<tr>
<td></td>
<td>Roger Y. Dodd</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Part III Practice in Blood Centres and Hospitals</td>
<td>184</td>
</tr>
<tr>
<td>18</td>
<td>Regulatory Aspects of Blood Transfusion</td>
<td>184</td>
</tr>
<tr>
<td></td>
<td>William G. Murphy, Louis M. Katz and Peter Flanagan</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>The Role of Haemovigilance in Transfusion Safety</td>
<td>193</td>
</tr>
<tr>
<td></td>
<td>Katharine A. Downes and Barbee I. Whitaker</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Donors and Blood Collection</td>
<td>203</td>
</tr>
<tr>
<td></td>
<td>Marc Germain, Ellen McSweeney and William G. Murphy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mindy Goldman</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Production and Storage of Blood Components</td>
<td>222</td>
</tr>
<tr>
<td></td>
<td>Marissa Li, Rebecca Cardigan, Stephen Thomas and Ralph Vassallo</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Blood Transfusion in Hospitals</td>
<td>233</td>
</tr>
<tr>
<td></td>
<td>Erica M. Wood, Mark H. Yazer and Michael F. Murphy</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Blood Transfusion in a Global Context</td>
<td>254</td>
</tr>
<tr>
<td></td>
<td>David J. Roberts, Alan D. Kitchen, Stephen P. Field, Imelda Bates,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jean Pierre Allain and Meghan Delaney</td>
<td></td>
</tr>
</tbody>
</table>
Contents

Part IV  Clinical Transfusion Practice  264

25  Inherited and Acquired Coagulation Disorders  264
   Irina Chibisov and Franklin Bontempo

26  Massive Blood Loss  279
   John R. Hess

27  Blood Management in Acute Haemorrhage and Critical Care  287
   Gavin J. Murphy, Nicola Curry, Nishith N. Patel and
   Timothy S. Walsh

28  Point-of-Care Testing in Transfusion Medicine  302
   Matthew D. Neal and Louis H. Alarcon

29  Haematological Disease  312
   Lise J. Estcourt, Simon J. Stanworth and Michael F. Murphy

30  Blood Transfusion in the Management of Patients with
    Haemoglobinopathies  330
   Enrico M. Novelli

31  Heparin-Induced Thrombocytopenia  341
   Andreas Greinacher and Theodore E. Warkentin

32  Immunodeficiency and Immunoglobulin Therapy  357
   Siraj A. Misbah

33  Transfusing Neonates and Infants  371
   Ronald G. Strauss

Part V  Patient Blood Management  383

34  Development of a Patient Blood Management Programme  383
   Jonathan H. Waters

35  Perioperative Patient Blood Management  393
   Martin Rooms, Ravishankar Rao Baikady and Toby Richards

36  Restrictive Transfusion Practice and How to Implement It  405
   Lawrence Tim Goodnough and Neil Shah

37  Using Data to Support Patient Blood Management  416
   Steven M. Frank and Jack O. Wasey
Part VI  Cellular and Tissue Therapy and Organ Transplantation  429

38 Regulation and Accreditation in Cellular Therapy  429
Zbigniew (Ziggy) M. Szczepiorkowski and Daniel Hollyman

39 Stem Cell Collection and Therapeutic Apheresis  442
Khaled El-Ghariani and Zbigniew (Ziggy) M. Szczepiorkowski

40 Haemopoietic Stem Cell Processing and Storage  455
Hira Mian, Ronan Foley and Pamela O'Hoski

41 Haematopoietic Stem Cell Transplantation  466
Robert D. Danby, Rachel Protheroe and David J. Roberts

42 Cord Blood Transplantation  477
Rachael Hough and Robert D. Danby

43 Recent Advances in Clinical Cellular Immunotherapy  490
Mark W. Lowdell and Emma Morris

44 Tissue Banking  500
Akila Chandrasekar, Paul Rooney and John N. Kearney

Part VII  Development of the Evidence Base for Transfusion  508

45 Observational and Interventional Trials in Transfusion Medicine  508
Alan T. Tinmouth, Dean Fergusson and Paul C. Hébert

46 Getting the Most Out of the Evidence for Transfusion Medicine  520
Simon J. Stanworth, Susan J. Brunskill, Carolyn Dorée and Sally Hopewell

47 A Primer on Biostatistics  533
Andrew W. Shih and Nancy M. Heddle

48 A Primer on Health Economics  549
Seema Kacker and Aaron A. R. Tobian

49 Scanning the Future of Transfusion Medicine  560
Jay E. Menitove, Paul M. Ness and Edward L. Snyder

Index  572