

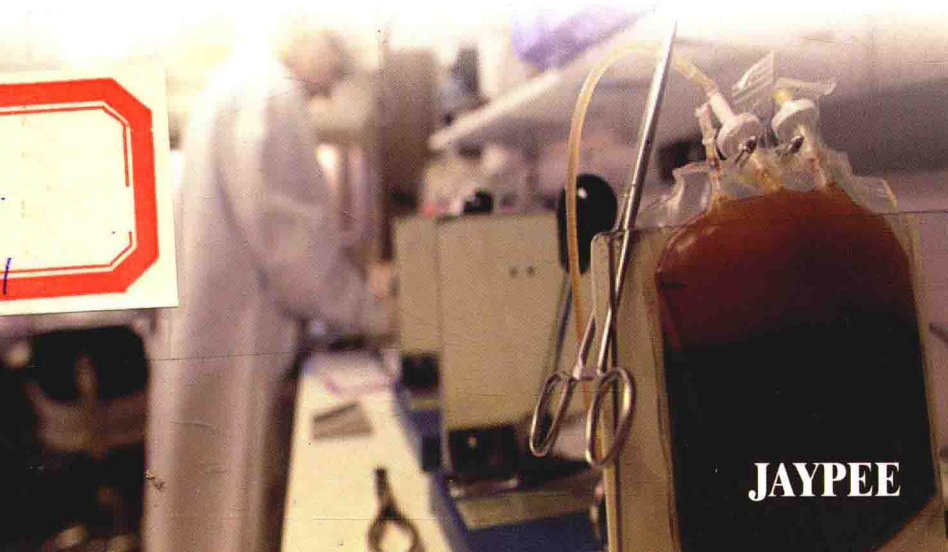
SECOND EDITION

SR Mehdi



BLOOD BANKING

(A Handbook for Students of Blood Banking and Clinical Residents)



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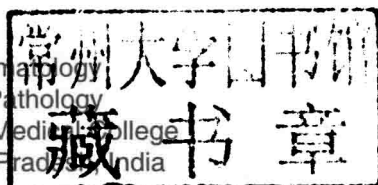
Essentials of **BLOOD BANKING**

A Handbook for
Students of Blood Banking and Clinical Residents

Second Edition

SR Mehdi MD

Professor of Hematology
Department of Pathology
Era's Lucknow Medical College
Lucknow, Uttar Pradesh, India



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Jaypee Brothers Medical Publishers (P) Ltd.

Headquarters

Jaypee Brothers Medical Publishers (P) Ltd.
4838/24, Ansari Road, Daryaganj
New Delhi 110 002, India
Phone: +91-11-43574357
Fax: +91-11-43574314
Email: jaypee@jaypeebrothers.com

Overseas Offices

J.P. Medical Ltd.
83, Victoria Street, London
SW1H 0HW (UK)
Phone: +44-2031708910
Fax: +02-03-0086180
Email: info@jpmepub.com

Jaypee-Highlights Medical Publishers Inc.
City of Knowledge, Bld. 237, Clayton
Panama City, Panama
Phone: +507-301-0496
Fax: +507-301-0499
Email: cservice@jphmedical.com

Jaypee Medical Inc.
The Bourse
111, South Independence Mall East
Suite 835, Philadelphia, PA 19106, USA
Phone: +267-519-9789
Email: joe.rusko@jaypeebrothers.com

Jaypee Brothers Medical Publishers (P) Ltd.
17/1-B, Babar Road, Block-B, Shaymali
Mohammadpur, Dhaka-1207
Bangladesh
Mobile: +08801912003485
Email: jaypeedhaka@gmail.com

Jaypee Brothers Medical Publishers (P) Ltd.
Shorakhute, Kathmandu
Nepal
Phone: +00977-9841528578
Email: jaypee.nepal@gmail.com

Website: www.jaypeebrothers.com

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Dedicated to
My parents

Preface to the Second Edition

Blood banking has come of age. The transfusion medicine is one of the thrust areas of medical research. The scare of transfusion-transmitted diseases and globalisation of AIDS have led to extraordinary media attention. The medicolegal aspects of blood banking act as a booster for maintaining quality and ensuring safety of blood.

Majority of the blood banks in the developing countries have developed their component laboratories. The use of whole blood is minimised day-by-day.

Almost all the departments of the hospital, surgical or non-surgical, hospital staff, medical or paramedical, and people in the form of patients or healthy blood donors come in contact of blood banks. The dissemination of knowledge of blood banking has become need of the hour.

I thank all my readers who had shown very good response to the first edition of this book.

Now, it is a pleasant feeling to write the preface for the second edition of the title *Essentials of Blood Banking (A Handbook for Students of Blood Banking and Clinical Residents)*. I have tried to incorporate in this edition the advancement in blood grouping and cross-matching techniques by the microtube gel method, screening of alloantibodies and apheresis. A new chapter on Obstetrical Transfusion Practice has also been added.

Many textbooks and technical manuals of blood banking are available in the market, but they are too exhaustive for the students who are not specialising in transfusion medicine and are interested only in the basic technical and clinical aspects of blood banking.

I hope this title would appeal to those students who look for a book on blood banking which is informative as well as handy.

I would like to thank my wife, daughter and son for providing me encouragement at each and every step of writing of the book. I am also indebted to my teachers and seniors who had always been a source of inspiration for me. I wish to thank my colleagues and students of medical colleges of Aligarh Muslim University, Aligarh, Uttar Pradesh, India, and King Saud University, Riyadh, Saudi Arabia, for creating an excellent academic and professional environment.

Last but not least, I thank M/s Jaypee Brothers Medical Publishers (P) Ltd, New Delhi, India, for advising me at each and every step of publication and coming out with the second edition of my title *Essentials of Blood Banking*.

SR Mehdi

Preface to the First Edition

In the last two decades, the progress in the field of blood banking has been phenomenal. Blood banking has grown up as transfusion medicine, an independent discipline. Blood banking is no more confined to only cross-matching and supply of blood. The spectrum of tests for transfusion-transmitted diseases is getting wider day-by-day. Pre-transfusion testing of blood for HIV1, HIV2, anti-HCV and in some of the countries, for HTLV1 has become mandatory, besides other tests. Newer techniques and latest generation testing kits are pouring in. Professional blood donors are banned.

HIV/AIDS awareness has shifted the focus of media on blood banks. Medicolegalities and ethical issues are very much in consideration. The talk of the day is Safety of the Blood. Regional transfusion centres have come up. Blood banks are directly under the supervision of the national and states AIDS Control Organisations.

The concept of whole blood transfusion has become obsolete. Transfusion of specific component of the blood has specific indications. A component laboratory is a must for every blood bank. The clinicians must be exposed to the usage and benefits of component therapy.

In this scenario, no person working in a hospital set-up, whether as a doctor or paramedic, can afford to be ignorant about the essentials of blood banking. The staff working in the transfusion services as "provider" and the clinicians and nurses acting as "facilitator" must ensure the transfusion of safe and disease-free blood to the "end user", i.e. the patient.

Therapeutic apheresis and stem cell collection have brought blood banking into clinical fold. Institutes are awarding MD and fellowships, exclusively in transfusion medicine. The progress and scope in the field of transfusion medicine is tremendous.

The handbook *Essentials of Blood Banking* deals with the basics of blood banking in brief, keeping in mind the requirements of the blood bank staff and the clinical residents. The blood bank personnel can refer to this book for techniques and the residents can carry the handbook to the wards. Even if one patient is saved of the complications of blood transfusion by the reader, the book will serve its purpose.

I wish to thank all my colleagues at the transfusion services of the Jawaharlal Nehru Medical College, Aligarh Muslim University, Aligarh, Uttar Pradesh, India, and the King Fahad Specialist Hospital, Buraidah, Kingdom of Saudi Arabia, who helped me to pick up the techniques of the trade by creating an enlightened and congenial working atmosphere. I would also like to thank National AIDS Control Organisation (NACO) and Uttar Pradesh State AIDS Control Society (UPSACS) for the best of the trainings and providing me an opportunity to serve as the Coordinator for Training of Trainers (TOT) Programme for HIV/AIDS.

SR Mehdi

Plate 1

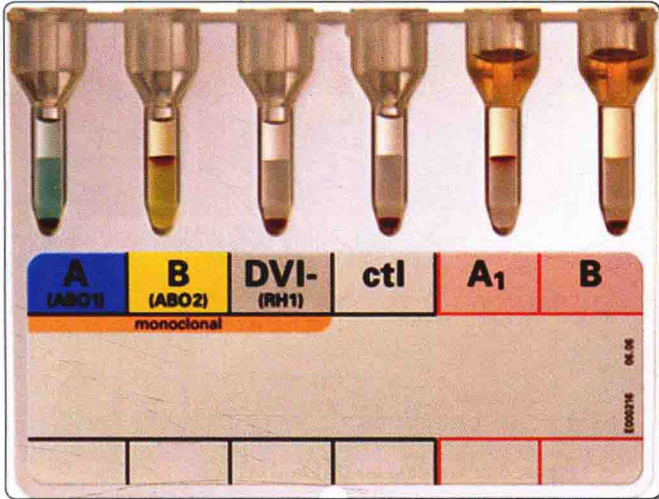


Figure 2.1: Gel card for ABO/D + Reverse grouping

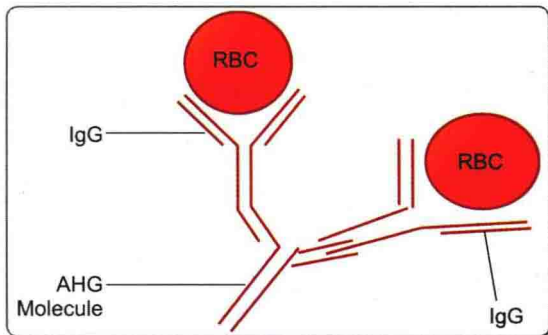


Figure 5.1: AHG molecule showing agglutination of RBC



Figure 5.2: Gel card for DAT and IAT (Coombs' tests)



Figure 6.1: Two donor's primary panel of cells

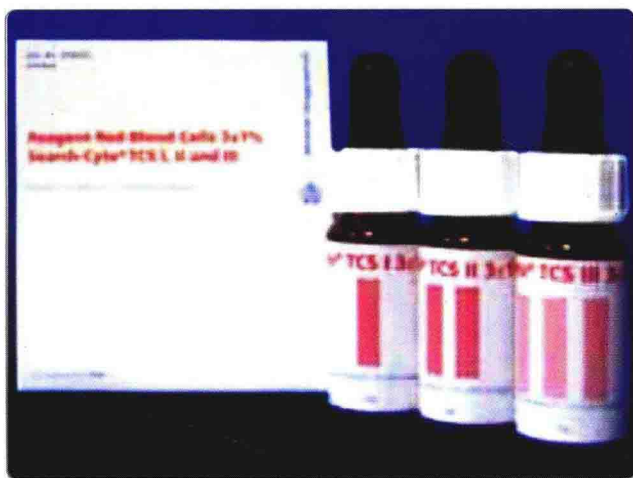


















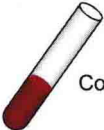
Figure 6.2: Three donor's primary panel of cells



Figure 6.3: Secondary panel of antibodies screening cells

Plate 4

Recipient's blood			Reactions with donor's red blood cells			
ABO antigens	ABO antibodies	ABO blood type	Donor type O cells	Donor type A cells	Donor type B cells	Donor type AB cells
None	Anti-A Anti-B	O				
A	Anti-B	A				
B	Anti-A	B				
A and B	None	AB				

 Compatible


 Not compatible

Figure 7.1: Diagrammatic presentation of ABO compatibility



Figure 15.1 Intraoperative blood salvage machine (Cell Saver)

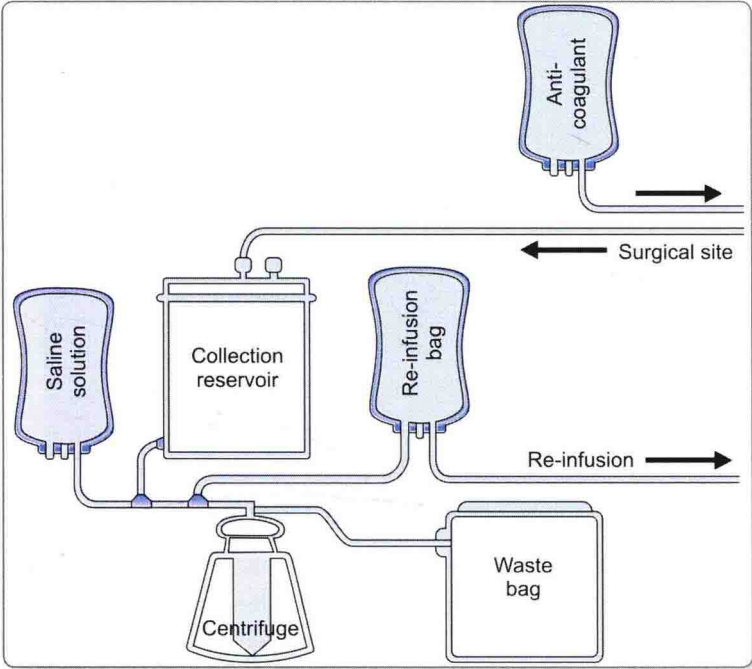


Figure 15.2: Intraoperative blood salvage diagram

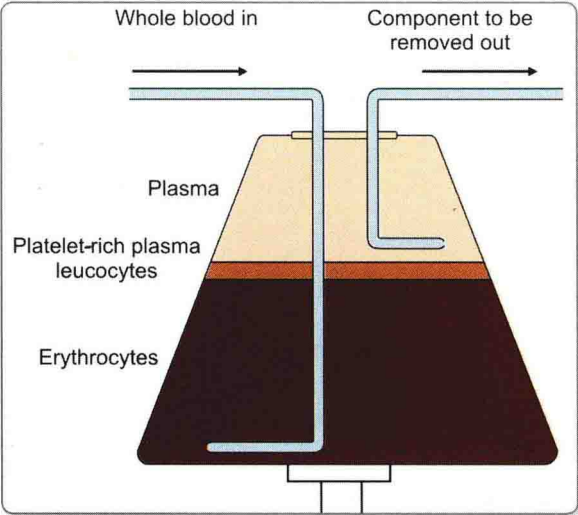


Figure 15.3: Diagrammatic presentation of functioning of apheresis

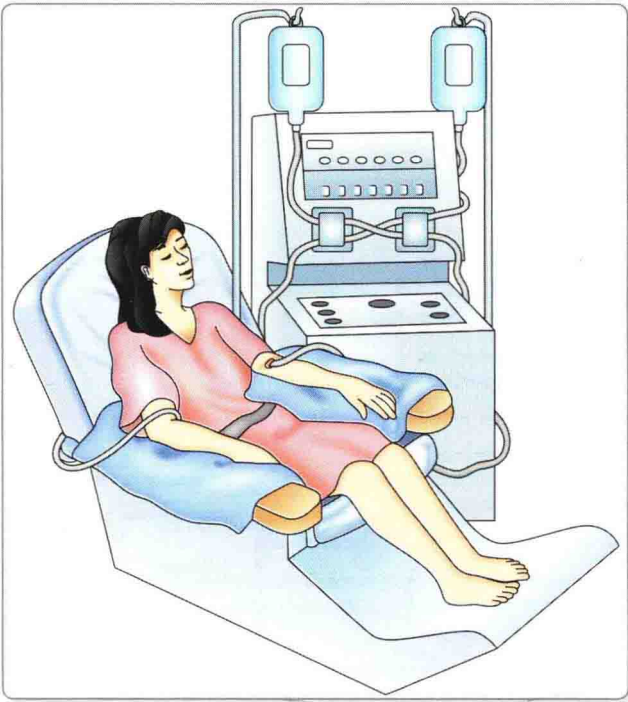


Figure 15.4: Functioning of a continuous flow separator



Figure 15.5: Therapeutic apheresis in progress

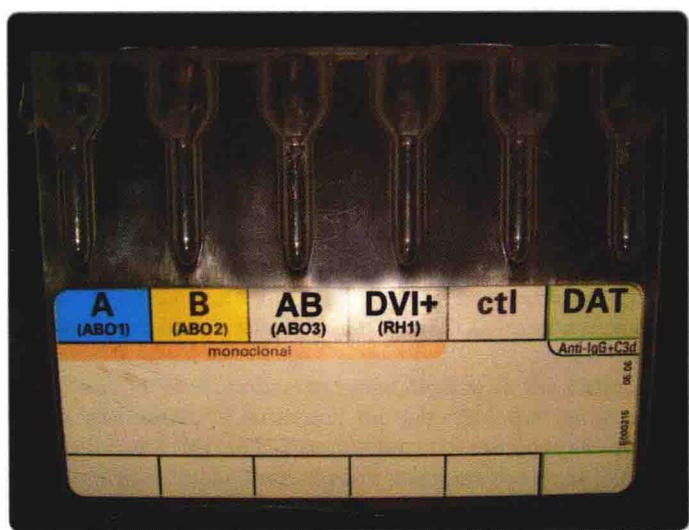


Figure 16.1: ABO blood grouping for newborns and DAT

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