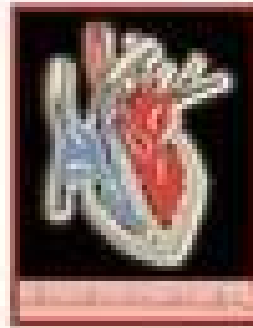
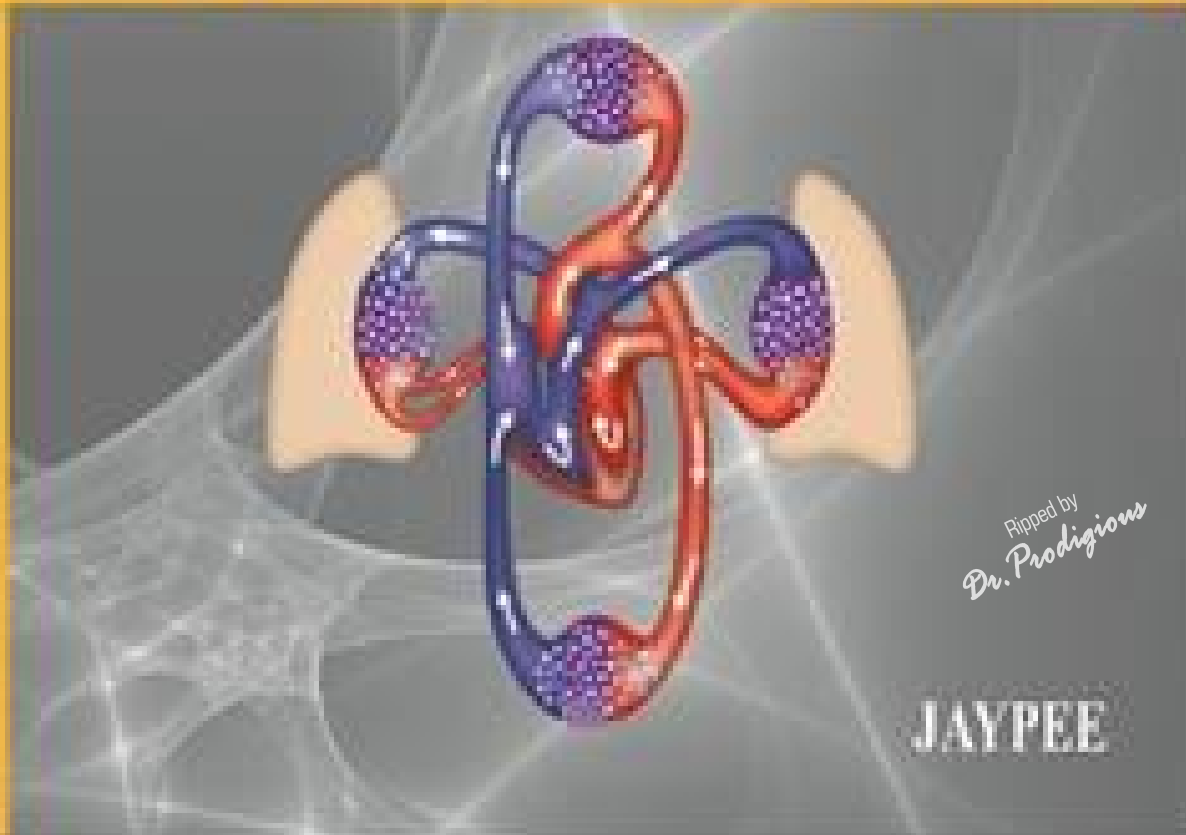


K Sembulingam
Prema Sembulingam



Essentials of
MEDICAL
PHYSIOLOGY

S I X T H E D I T I O N



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JAYPEE

PHYSIOLOGY

Essentials of
Medical Physiology

Essentials of **Medical Physiology**

Sixth Edition

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and

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Our beloved students

Foreword to the Sixth Edition



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Dr S MADAN KUMAR MD, Dip. A & E

Director

It is my privilege and pleasure to give this foreword to sixth edition of the textbook *Essentials of Medical Physiology* written by two of our dedicated and renowned teachers Dr K Sembulingam and Dr Prema Sembulingam. Since the publication of first edition in the year 1999, this book has been accepted by the faculty of many universities in and out of country. It has become popular among medical, dental and paramedical students because of its elegant presentation, simple language and clear illustrations with diagrams, flow charts and tables.

The authors have taken concerted efforts to improve the contents and update the information in every subsequent edition of this book. This sixth edition with newly formatted and updated tables, flow charts and self-explanatory diagrams will help the students in better understanding and performance in various types of examinations. Clinical physiology with updated information in this edition will help the students for their clinical knowledge to a great extent.

I congratulate Dr K Sembulingam and Dr Prema Sembulingam on their great effort in bringing sixth edition of this book.

Dr S Madan Kumar MD, Dip. A & E
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Foreword to the First Edition

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It is indeed with a great sense of pleasure and privilege that I give this foreword to the book *Essentials of Medical Physiology* written by two of our dedicated teachers Dr K Sembulingam and Dr Prema Sembulingam. The students have always appreciated the efforts of these two teachers and their ability to make physiology easily comprehended and interesting. Why one more book in physiology, is what I asked myself first before I reviewed the book. The book has been largely directed to the broad and specific needs of the undergraduate students, and simplicity and clarity have been emphasized. The students can easily assimilate the logical sequence in which the subjects have been presented not only for them to understand the same but also perform well in the various types of objective and routine examinations.

Several readily understandable diagrams and tables have been included to make subject comprehension and revision easy. Applied physiology, clinical importance and altered situations in pediatrics, geriatrics and pregnancy have been well brought out. The approach utilized in dealing with the subject of physiology would be appreciated by other teachers as well. I have no doubts that this will be a valuable addition to the armamentarium of a student of physiology who is preparing for examination and is seeking a strong foundation to build further on.

Here at Sri Ramachandra Medical College and Research Institute (Deemed University), Chennai, Tamil Nadu, India, the faculty involved in writing and editing books of this nature are greatly appreciated, and I as its Vice-Chancellor wish to congratulate the Sembulingams on their great effort.

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Preface to the Sixth Edition

With this Sixth edition, Sembulingam's *Essentials of Medical Physiology* enters into its second decade and the core subject matter with updated physiological information remain as green as ever. We live in an era where the thirst for knowledge and urge for learning is so much increased that even a layman knows the fundamentals of common disorders like diabetes mellitus, hypertension, jaundice, etc. So, it becomes doubly important to fulfill the expectations of the educated mass, especially in medical field.

We are humbly thankful and heavenly happy for the popularity of this book among the undergraduate and postgraduate students of medical, dental and paramedical courses, doctors and other health professionals in and out of our country.

Like many other successful textbooks, this book also has sailed through the years smoothly, fruitfully and successfully. May be because, it meets the needs of every group of the readers. Students are happy because it is student-friendly while reading, and exam-friendly while revising. Knowledge seekers are happy because they get the updated and recent developments in the field of physiology. Doctors are happy because applied aspects are covered adequately.

Our thirst for improving this textbook is growing every year by seeing outright acceptance of this book by the students, and the appreciation and overwhelming support given by our fellow teachers. The most comments and the suggestions, we receive from our readers, are responsible for better shaping of this book in every edition.

This edition is enriched with addition of many more flow charts, tables and descriptive diagrams to make the subject matter easier and approachable for all class of students. Many chapters are upgraded as per the suggestions from our colleagues and fellow teachers from various institutes and universities in and out of India.

Our thirst for improving this book is still alive. The improvement is possible only by the comments and suggestions expressed by the readers. So, we welcome the opinions, comments and valuable suggestions from one and all who happen to come across this book.

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Preface to the First Edition

The need for having a simple book with basic principles of Medical Physiology has been felt since long. A sincere and maiden attempt has been made with the idea of fulfilling the requirements of present-day curriculum. The script of the book is formatted in such a way that it will be suitable not only for medical students, but also for dental students and the students of allied health subjects like Physiotherapy, Occupational Therapy, Pharmacy, Nursing, Speech, Hearing and Language, etc.

Written in a textbook form, this book encompasses the knowledge of basic principles of physiology in each system. An attempt is also made to describe the applied physiology in each system.

To give an idea of the matters to be studied, the topics are listed at the beginning of each chapter. Most of the figures are given in schematic form to enable students to understand and reproduce the facts. The probable questions given for each section will help the students preparing for examinations. However, it will be ideal for the students to read each section thoroughly before referring to the questions.

We will be very happy to receive opinions, comments and valuable suggestions from all our senior colleagues, fellow teachers and students so that, every aspect of the book can be reviewed in succeeding editions.

K Sembulingam
Prema Sembulingam

Acknowledgments

We express our profound gratitude to Late Mr NPV Ramasamy Udayar, Founder Chancellor, Sri Ramachandra Medical College and Research Institute (Deemed University), Chennai, Tamil Nadu, India for his keen interest in all the academic activities of the faculty members.

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We sincerely thank Mrs Radha Venkatachalam, Registrar and Administrative Director, Sri Ramachandra Medical College and Research Institute (Deemed University), who always encouraged the faculty of the university for publications.

We thank Dr Sylvia Walter, Professor Emeritus, Department of Physiology, Sri Ramachandra Medical College and Research Institute (Deemed University), who is the inspiration for us to bring out this book. We are also indebted to her for giving many valuable clues to modify the script in many chapters. Our special thanks to Dr V Srinivasan, Former Professor and Head, Department of Physiology, Sri Ramachandra Medical College and Research Institute (Deemed University) for his strong belief in this project, constant encouragement and valuable suggestions. We are very much grateful to Dr V Srinivasan for his keen interest and valuable suggestions for upgrading the script in each edition.

We thank all our fellow teachers and senior professors from various institutes and universities in and out of India for their comments and suggestions, which enabled us to bring out each edition of the book successfully.

We are deeply indebted to our students of Sri Ramachandra Medical College and Research Institute (Deemed University), Chennai, Tamil Nadu, India and MR Medical College, Gulbarga, Karnataka, India who were the spirit behind the idea of bringing out this book.

Our special thanks to Dr M Chandrasekar, Vice-Principal and Head, Department of Physiology, Meenakshi Medical College, Kanchipuram, Tamil Nadu, India for writing a review article on this book in the Journal 'Biomedicine' (Vol 20, No. 1). Many valuable suggestions from him enabled us to upgrade the book in each edition.

We are grateful to Professor Mafauzy Mohamad, Director, Health Campus, Universiti Sains Malaysia, Kelantan, Malaysia for providing the photos of endocrine disorder patients. We are thankful to Dr Nivaldo Medeiros, Former Director of Hematology and Cytology Services, Central Laboratory, University of São Paulo, School of Medicine, USA for giving us the hematology pictures.

Our profound thanks are due to Dr S Peter, Founder and Chairman, Madha Group of Academic Institutions for the recognition, appreciation and encouragement given to us in bringing out this edition. We are thankful to Dr S Madan Kumar, Director, Madha Medical College & Research Institute for his keen interest in publishing this edition. We also thank him for accepting and rendering foreword for this edition. We thank Dr K Gajendran, Principal, Madha Medical College & Research Institute for his constant encouragement in bringing out this edition.

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