Textbook of MEDICINE

5th Edition

KV Krishna Das
BSc MBBS FRCP(E) FAMS (India) DTM and H (Edin)
Formerly Director and Professor
Department of Medicine
Medical College, Thiruvananthapuram
Kerala, India
This book is dedicated to my alma mater –
Medical College and Hospital, Thiruvananthapuram –
where I started learning the first principles of medicine and thereafter; had the honour to serve as its staff and continue my close association with the college even several years after my retirement
Contributors

Ananda Kumar MD, DM
Professor, Department of Neurology
Amrita Institute of Medical Sciences, Kochi
Chapters 194, 195, 197, 199, 200

Asha Kishore MD, DM
Additional Professor, Department of Neurology
Sree Chithira Thirunal Institute of Medical Sciences and Technology, Thiruvananthapuram
Chapter 191

Aswini Kumar MD
Professor, Department of Medicine
Medical College and Hospital, Thiruvananthapuram
Chapters 3-5, 59, 60

C.G Bahuleyan MD, DM
Formerly Professor and Head
Department of Cardiology
Medical College and Hospital, Thiruvananthapuram
Consulting Cardiologist
Ananthapuri Hospital and Research Centre
Thiruvananthapuram
Chapters 115-117, 119-121, 124-130

S. Bhasi MD
Professor, Department of Medicine
Sri Gokulam Medical College
Venjaramoodu, Thiruvananthapuram District, Kerala
Chapters 5, 6, 34-36, 39-41

S.R. Chandra MD, DM
Professor and Head, Department of Neurology
Medical College and Hospital, Thiruvananthapuram
Chapters 182-185, 193, 196, 201

Dinesa Prabhu V. MD, DTCD
Associate Professor
Department of Respiratory Diseases
Medical College and Chest Diseases Hospital
Thiruvananthapuram
Chapters 135, 137, 139, 140, 143, 144, 147

A.S. Girija MD, DM
Formerly Professor and Head
Department of Neurology
Medical College and Hospital, Kozhikode
Consultant Neurologist
MIMS Hospital, Kozhikode
Chapters 186, 189, 190, 202, 203

Lt Col. V.P. Gopinathan MD, MNAMS
Professor and Head
Department of Pulmonary Medicine
Jubilee Mission Medical College and Research Institute, Trichur
Formerly Professor of Medicine at AFMC, Pune
Chapters 42, 45, 64, 65

Jacob George MD, DM
Associate Professor, Department of Nephrology
Medical College, Thiruvananthapuram
Chapters 169, 175, 176, 181

Jalesh N. Panicker MD, DM
Assistant Professor, Department of Neurology
Amrita Institute of Medical Sciences, Kochi
Chapters 187, 188, 198

R.V. Jayakumar MD, DM, FRCP
Professor and Head, Department of Endocrinology
Amrita Institute of Medical Sciences, Kochi
Formerly Professor and Head
Department of Medicine
Medical College, Thiruvananthapuram
Chapters 90-92, 100-102

B. Jayakumar MD, DM
Professor and Head, Department of Medicine
Medical College and Hospital, Thiruvananthapuram
Chapters 95-97, 99

R. Kasi Visweswaran MD, DM, MNAMS
Formerly Professor and Head
Department of Nephrology
Medical College and Hospital, Thiruvananthapuram
Consultant Nephrologist
Ananthapuri Hospital and Research Centre
Thiruvananthapuram
Chapters 72-74, 170, 177

K.V. Krishna Das BSc, MBBS, FRCP(E), FAMS (India)
DTM &H (Edin)
Formerly Director and Professor
Department of Medicine
Medical College, Thiruvananthapuram
Consultant Physician and Hematologist
Medical Writing – Medical Teaching
S. Krishnakumar MD, FRCP(London), FRCP(Glasgow)
Formerly Professor
Department of Medicine and Nephrologist
Medical College, Thiruvananthapuram
Consultant Physician
Chapter 175

N. Krishnan Kutty MD (Psych)
Formerly Professor, Department of Psychiatry
Medical College, Thiruvananthapuram
Consultant Psychiatrist
Chapters 219-236

B. Krishna Swamy MD
Formerly Professor and Head
Department of Geriatrics
Madras Medical College, Chennai
Chapter 103

Mathew Thomas MD
Department of Medicine and Hematologist
Dr Somervel Medical College
Karakanom, Trivandrum District
Formerly Professor and HOD
Medical College, Thiruvananthapuram
Chapters 154, 158, 159, 162-167

P.K. Mohan (Late) MD, DM
Formerly Professor
Department of Neurology
Sree Chithira Thirunal Institute of Medical Sciences and Technology
Thiruvananthapuram (Expired 2007)
Chapters 182-190, 192-203

K.P. Poulose MD
Formerly Professor and Head
Department of Medicine
Medical College, Kottayam
Physician and Endocrinologist
SUT Hospital, Thiruvananthapuram
Chapters 90-92, 95-102

Pradeep S. Nair MD
Assistant Professor
Department of Dermatology and Venereology
Medical College and Hospital
Thiruvananthapuram
Chapters 210-218

Lt. Col. K.E. Rajan MD
Professor, Department of Medicine and Physician
SUT Medical College, Vattappara
Thiruvananthapuram
Formerly Professor
Department of Medicine AFMC, Pune
Chapters 133, 136, 138, 145, 146

Ramdas Pisharody MD, DM
Professor and Head, Department of Nephrology
Medical College, Thiruvananthapuram
Chapters 170, 178-180

Ronald Win B. MD (Chest Diseases)
Assistant Professor
Department of Respiratory Diseases
Medical College and Chest Diseases Hospital
Thiruvananthapuram
Chapters 131, 132, 134, 141

R. Sajith Kumar MD
Associate Professor, Department of Medicine
(Infectious Diseases)
Medical College, Kottayam
National Trainer on AIDS, NACO, Govt of India
Chapters 44, 48

P.K. Sasidharan MD
Professor and Head, Department of Medicine and Hematologist, Medical College, Kozhikode
Chapters 155, 157, 160, 161

R.K. Shenoy MD
Formerly Professor and Head
Department of Medicine
Medical College, Alappuzha
Consulting Physician
Chief Investigator
Filariasis Research Unit, WHO
Medical College Hospital, Alappuzha
Chapters 66-71

S. Sivasankaran MD, DM, Dip, NB (Cad)
Additional Professor, Department of Cardiology
Sree Chithira Thirunal Institute of Medical Sciences and Technology, Thiruvananthapuram
Chapter 118

K. Sreekantan MD
Associate Professor, Department of Medicine
(Infectious Diseases)
Medical College, Thiruvananthapuram
Chapters 59, 60

M. Sreelatha MD, DM
Associate Professor, Department of Nephrology
Medical College, Kozhikode
Chapter 180

C. Sudheendra Ghosh MD (Respiratory Medicine), MPH
Professor and Head
Department of Respiratory Diseases
Medical College and Chest Diseases Hospital
Thiruvananthapuram
Chapters 131, 132, 134, 135, 137, 139-144, 147
Susan Uthup MD, DM  
Assistant Professor  
Department of Nephrology (Pediatric)  
SAT Hospital, Medical College  
Thiruvananthapuram  
*Chapters* 168, 172, 173, 177

K. Suresh MD, DM  
Professor and Head, Department of Cardiology  
Medical College, Thiruvananthapuram  
*Chapters* 122, 123, 125

T.K. Suma MD  
Associate Professor, Department of Medicine  
TD Medical College, Alappuzha  
*Chapters* 12-26

M. Thomas Mathew MD  
Formerly Professor and Head  
Department of Nephrology  
Medical College, Kozhikode  
Nephrologist  
Baby Memorial Hospital, Kozhikode  
*Chapter* 174

A.G. Unnikrishnan MD, DM  
Assistant Professor  
Department of Endocrinology  
Amrita Institute of Medical Sciences, Kochi  
*Chapters* 90-92, 100-102

Usha Vaidhyananthan MBBS, DIP NB  
(Dermatology & Venereology)  
Physician  
KIMS Hospital, Thiruvananthapuram  
*Chapters* 47, 48, 204-209

A. Vimala MD, DM  
Professor and Head  
Department of Nephrology  
Government Medical College, Kottayam  
*Chapters* 171-173

K.R. Vinaya Kumar MD, DM, MRCP  
Professor and Head  
Department of Gastroenterology  
Medical College, Thiruvananthapuram  
*Chapters* 75-89
Preface to the Fifth Edition

This volume has evolved through four editions, the fourth one was published in 2002. The first edition was introduced as ‘A Short Textbook of Medicine’, now it has increased in the volume of contents and improved in its quality, commensurate with the quantitative and qualitative advancements in medical information.

Six years is too long a gap for a textbook to be up-to-date and useful, but the demand among students and teachers were the guidelines to continue with the fourth edition until 2008.

As mentioned earlier, the book has been given a new direction, both in its get up and format, so as to include the latest information and present it in a student-friendly manner. This book has been designed to include the up-to-date information obtainable from print material and electronic data and has been presented in a simple language in form of direct statements, so as to make the matter more vivid and comprehensible to the medical students and doctors in India and the neighbouring countries coming from different social and language backgrounds. In areas where more detailed information is desirable for the practitioners and the postgraduate students, authentic reviews and original works are referred to.

Several new figures, many of them taken personally by the contributors from their own clinical practice and flow charts and tables have been added.

Along with several chapters a short summary is given to serve as a ready-reckoner for the students preparing for the examination or the busy practitioners who have only limited time at their disposal.

This volume is intended for the use of undergraduate and postgraduate students of medicine, dental sciences and other allied subjects, students preparing for entrance examinations and practitioners working in India and the neighbouring countries.

All the sections have been thoroughly revised. The number of contributors has also increased including teachers in specialities who have made their mark in their respective specialisation.

The first edition of the “Short Textbook” was produced in 1986 to fulfil a long-felt and widespread need among the undergraduate and postgraduate students, majority of whom relied on class notes or handbooks written on the various subjects by several authors. Many had no access to textbooks and the big volumes available were beyond their understanding. Comprehensive textbooks catering to the needs of the undergraduate medical students written by Indian authors were only a handful. Books published in other countries are quite freely available to our students, but naturally their emphasis is on the conditions prevailing in those countries.

The medical problems of India are unique as the peculiar disease–spectrum here is a blend of what is seen in the affluent countries with what is seen in most developing countries. This Textbook of Medicine has been written with this picture in mind. The section on tropical diseases, which usually gets a separate deal in most of the western textbooks, has been dovetailed into the other sections such as infections, physical agents, nutrition and others to improve the understanding of these subjects. Almost the whole of India is in tropical belt and therefore diseases rampant in tropical countries with a few exceptions like trypanosomiasis, onchocerciasis and others are present in all parts of the country.

This book has its companion volume “Clinical Medicine” third edition edited by me and published by the same publishers in 2005. It gives in detail the clinical aspects of medical practice and investigations. The reader is referred to “Clinical Medicine” for further details on physical examination, clinical symptoms, signs and investigation procedures.
Obsession with the printed matter is the habit of the mediocre; the wise go beyond it and use their common-sense, experience and creativity to form their own decisions.

My contributors have strived hard to collect the material and present it the way it has been done. All of them are veteran teachers and their presentations will be helpful to the entire readership. This book is the collective effort of the whole team, laying emphasis on several aspects of Internal Medicine with special emphasis on conditions prevailing in India and the neighbouring countries.

Human efforts by themselves are lifeless “karma tat jadam” (Ramana Maharshi in his Upadesa Sara). They get life and effect only when blessed by the Almighty to achieve the desired effect. This is especially so in medicine, in that both the patient and his physician have to be lucky to get the best results of investigation and treatment. I wish and pray to Almighty, the first physician in the universe to bless all and alleviate suffering. Yajurveda proclaims “prathamo daiyvo bhishak” meaning the “first physician is God”. I would consider the work of my teammates and myself fulfilled, if the young entrants into the medical profession in India and the neighbouring countries find this book useful in his studies and career.

K.V. Krishna Das
Preface to the First Edition

This book is written to fulfill a long-felt and widespread need among the undergraduate students. A questionnaire sent to several hundreds of clinical students revealed that majority of them rely on class notes, and handbooks written in the subject by several authors. Many had no access to textbooks in the subject and the big volumes available were beyond their understanding. Comprehensive textbooks catering to the need of undergraduates written by Indian authors are only a few. Books published in other countries are quite freely available to our students, but naturally their emphasis is on conditions prevailing in their lands.

The medical problems of India are unique in that the disease-spectrum is a blend of what is seen in the affluent countries with what is seen in developing countries. This book has been written with this picture in mind. The section on “tropical diseases” which usually gets a separate deal in most of the textbooks has been dovetailed into the other sections such as infections, physical agents, nutrition, etc. It is my feeling that with modern jet travel and the rapidly changing life-styles of Indian subjects, all diseases—the most modern and the most ancient are likely to be encountered by the clinical student in this country. Moreover, the so-called tropical diseases which used to be confined to the tropical belt, are now seen widely all over the world as a result of free and fast migration of population.

I consider my purpose fulfilled if the undergraduates in this country find this book useful.

K.V. Krishna Das
I acknowledge with thanks the help, support and patience of my wife Smt L.N.Kamalam who encouraged me in my task and endured all the inconvenience and disruption of domestic routine due to my prolonged and generally untimely work schedule, I had to pursue in completing the task.

I had to depend heavily on doctors S. Aswini Kumar, K. Sreekanthan, Mathew Thomas and P.K. Sasidharan who helped me to review the chapters and offered suggestions for improvement and also reviewed the proofs critically.

I express my indebtedness to Shri J.P. Vij, Chairman and Managing Director of M/s Jaypee Brothers Medical Publishers (P) Ltd and his teammates especially Mr Tarun Duneja, Director (Publishing) who gave constant support in the form of timely suggestions, prompt execution of the work and appropriate technical help. I thank M/s. Krishnakumar and Associates for the typographical work and preparation of the matter in print and CD.

To all human efforts the divine influence has to be in constant attendance. I thank the Almighty to have allowed me to complete this task of editing the fifth revised and enlarged edition along with my team of section editors and contributors.
# Editorial Committee

**Editor**

**K.V. Krishna Das**

Bsc MBBS FRCP(E), FAMS (India) DTM and H (Edin)

<table>
<thead>
<tr>
<th>Section Editor</th>
<th>Section</th>
<th>Title</th>
<th>Chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td>K.V. Krishna Das</td>
<td>Section 1</td>
<td>General Topics</td>
<td>Ch 1–8</td>
</tr>
<tr>
<td>K.V. Krishna Das</td>
<td>Section 2</td>
<td>Diseases due to Arthropods, Marine Animals and Snakes</td>
<td>Ch 9–11</td>
</tr>
<tr>
<td>K.V. Krishna Das</td>
<td>Section 3</td>
<td>Disorder due to Physical Agents</td>
<td>Ch 12–21</td>
</tr>
<tr>
<td>K.V. Krishna Das</td>
<td>Section 4</td>
<td>Toxicology</td>
<td>Ch 22-26</td>
</tr>
<tr>
<td>K.V. Krishna Das</td>
<td>Section 5</td>
<td>Nutrition</td>
<td>Ch 27–33</td>
</tr>
<tr>
<td>R Sajith Kumar, K.V. Krishna Das, R.K. Shenoy</td>
<td>Section 6</td>
<td>Diseases Caused by Infections</td>
<td>Ch 34–71</td>
</tr>
<tr>
<td>R. Kasi Visweswaran</td>
<td>Section 7</td>
<td>Fluid and Electrolytes</td>
<td>Ch 72-74</td>
</tr>
<tr>
<td>K.R. Vinaya Kumar</td>
<td>Section 8</td>
<td>Gastroenterology</td>
<td>Ch 75–81</td>
</tr>
<tr>
<td>K.R. Vinaya Kumar</td>
<td>Section 9</td>
<td>Hepatobiliary System and Pancreas</td>
<td>Ch 82–89</td>
</tr>
<tr>
<td>R.V. Jayakumar, K.P. Poulose</td>
<td>Section 10</td>
<td>Diabetes Mellitus, Other Metabolic Disorders and Inherited Disorders of Connective Tissue</td>
<td>Ch 90–94</td>
</tr>
<tr>
<td>K.P. Poulose</td>
<td>Section 11</td>
<td>Endocrinology including Geriatrics</td>
<td>Ch 95–103</td>
</tr>
<tr>
<td>K.V. Krishna Das</td>
<td>Section 12</td>
<td>Rheumatology</td>
<td>Ch 104–114</td>
</tr>
<tr>
<td>C.G. Bahuleyan</td>
<td>Section 13</td>
<td>Cardiology</td>
<td>Ch 115–130</td>
</tr>
<tr>
<td>C Sudheendra Ghosh</td>
<td>Section 14</td>
<td>Respiratory System</td>
<td>Ch 131–147</td>
</tr>
<tr>
<td>K.V. Krishna Das, Mathew Thomas</td>
<td>Section 15</td>
<td>Hematology</td>
<td>Ch 148 -167</td>
</tr>
<tr>
<td>R. Kasi Visweswaran</td>
<td>Section 16</td>
<td>Nephrology</td>
<td>Ch 168–181</td>
</tr>
<tr>
<td>A.S. Girija</td>
<td>Section 17</td>
<td>Neurology</td>
<td>Ch 182–203</td>
</tr>
<tr>
<td>Usha Vaidhyananthan</td>
<td>Section 18</td>
<td>Dermatology</td>
<td>Ch 204–218</td>
</tr>
<tr>
<td>N. Krishnan Kutty</td>
<td>Section 19</td>
<td>Psychiatry</td>
<td>Ch 219–236</td>
</tr>
</tbody>
</table>
## Contents

### SECTION 1
**GENERAL TOPICS**

1. **Introduction to Medicine**  
   K.V. Krishna Das  
   2
2. **Medical Genetics**  
   K.V. Krishna Das  
   6
3. **Defence Mechanisms of the Host and Clinical Immunology**  
   K.V. Krishna Das, Aswini Kumar  
   15
4. **Principles of Drug Administration**  
   Aswini Kumar, K.V. Krishna Das  
   29
5. **Antimicrobial Agents**  
   K.V. Krishna Das, S. Bhasi, Aswini Kumar  
   35
6. **Therapeutics of Glucocorticoids**  
   S. Bhasi  
   53
7. **Principles of Oncology**  
   K.V. Krishna Das  
   56
8. **Organ Imaging Techniques**  
   K.V. Krishna Das  
   67

### SECTION 2
**DISEASES DUE TO ARTHROPODS, MARINE ANIMALS AND SNAKES**

9. **Myiasis**  
   K.V. Krishna Das  
   74
10. **Arthropod Bites and Stings and Injuries due to Marine Animals**  
    K.V. Krishna Das  
    76
11. **Snake Bite**  
    K.V. Krishna Das  
    80

### SECTION 3
**DISORDER DUE TO PHYSICAL AGENTS**

12. **Disorders Caused by Heat**  
    T.K. Suma, K.V. Krishna Das  
    86
13. **Injuries due to Cold**  
    T.K. Suma, K.V. Krishna Das  
    90
14. **Disorders due to Alterations in Barometric Pressure**  
    T.K. Suma, K.V. Krishna Das  
    93
15. **Diseases due to High Altitude**  
    T.K. Suma, K.V. Krishna Das  
    95
16. **Drowning**  
    T.K. Suma, K.V. Krishna Das  
    98
17. **Injuries due to Ionizing Radiations**  
    T.K. Suma, K.V. Krishna Das  
    99
18. **Electrical Injuries and Lightning**  
    T.K. Suma, K.V. Krishna Das  
    101
19. **Dangers of Nuclear Explosion**  
    T.K. Suma, K.V. Krishna Das  
    103
20. **Adverse Effects due to Noise and Vibrations**  
    T.K. Suma, K.V. Krishna Das  
    104
21. **Motion Sickness, Problems due to Air Travel and Road Accidents**  
    T.K. Suma, K.V. Krishna Das  
    106

### SECTION 4
**TOXICOLOGY**

22. **Acute Poisoning: General Considerations**  
    T.K. Suma, K.V. Krishna Das  
    112
23. **Common Poisons**  
    T.K. Suma, K.V. Krishna Das  
    116
24. **Food Poisoning**  
    T.K. Suma, K.V. Krishna Das  
    125
25. **Endemic Fluorosis**  
    T.K. Suma, K.V. Krishna Das  
    131
26. **Tobacco and Health**  
    T.K. Suma, K.V. Krishna Das  
    134

### SECTION 5
**NUTRITION**

27. **Nutrition: General Considerations**  
    K.V. Krishna Das  
    138
28. **Starvation**  
    K.V. Krishna Das  
    146
29. **Protein-Energy Malnutrition**  
    K.V. Krishna Das  
    147
30. **Fat Soluble Vitamins**  
    K.V. Krishna Das  
    149
31. Water Soluble Vitamins 156
   K.V. Krishna Das
32. Minerals 161
   K.V. Krishna Das
33. Obesity 168
   K.V. Krishna Das

SECTION 6
DISEASES CAUSED BY INFECTIONS

34. Infections: General Considerations 174
   S. Bhasi
35. Fever of Unknown Origin (FUO) 179
   S. Bhasi
36. Sepsis and Septic Shock 184
   S. Bhasi
37. Systemic Diseases Caused by Cocci 188
   K.V. Krishna Das
38. Common Bacterial Infections of Childhood 203
   K.V. Krishna Das
39. Salmonella Infections 209
   S. Bhasi, K.V. Krishna Das
40. Gram-negative Bacterial Infections 215
   S. Bhasi
41. Anthrax, Plague, Brucellosis 221
   S. Bhasi, K.V. Krishna Das
42. Diarrheal Diseases of Infective Origin 226
   V.P. Gopinathan, K.V. Krishna Das
43. Bartonellosis, Legionellosis, Yaws, Pinta, Relapsing Fevers, Lyme Borreliosis 233
   K.V. Krishna Das
44. Leptospirosis 239
   R. Sajith Kumar, K.V. Krishna Das
45. Rickettsial Diseases and Q Fever 242
   K.V. Krishna Das, V.P. Gopinathan
46. Anaerobic Infections: Tetanus and Gas Gangrene 246
   K.V. Krishna Das
47. Sexually Transmitted Diseases 252
   K.V. Krishna Das, Usha Vaidhyanathan
48. Sexually Transmitted Viral Diseases Including AIDS 263
   K.V. Krishna Das, Usha Vaidhyanathan, R. Sajith Kumar
49. Mycobacterial Infections 275
   K.V. Krishna Das
50. Psittacosis 296
   K.V. Krishna Das
51. Viral Infections 297
   K.V. Krishna Das
52. Viral Infections of the Respiratory Tract 299
   K.V. Krishna Das
53. Exanthems and Enanthems 304
   K.V. Krishna Das
54. Mumps 315
   K.V. Krishna Das
55. Viral Hepatitis 316
   K.V. Krishna Das
56. Enteroviruses 328
   K.V. Krishna Das
57. Adenovirus Infections 332
   K.V. Krishna Das
58. Arena Virus Infections and Hemorrhagic Fevers 333
   K.V. Krishna Das
59. Rabies 334
   K.V. Krishna Das, K. Sreekanthan, Aswini Kumar
60. Arboviruses 339
   K. Sreekanthan, Aswini Kumar, K.V. Krishna Das
61. Other Viral Infections 347
   K.V. Krishna Das
62. Systemic Fungal Infections 351
   K.V. Krishna Das
63. Actinomyces and Nocardia 356
   K.V. Krishna Das
64. Disease Caused by Protozoa 358
   V.P. Gopinathan, K.V. Krishna Das
65. Amebiasis, Giardiasis, Balantidiasis, Toxoplasmosis and Cryptosporidiosis 380
   K.V. Krishna Das, V.P. Gopinathan
66. Helminthiasis: General Considerations 390
   R.K. Shenoy, K.V. Krishna Das
67. Intestinal Nematodes 392
   R.K. Shenoy, K.V. Krishna Das
68. Cestodiasis 400
   R.K. Shenoy, K.V. Krishna Das
69. Trematode (Fluke) Infections 406  
R.K. Shenoy, K.V. Krishna Das  

70. Tissue Nematodes 411  
R.K. Shenoy, K.V. Krishna Das  

71. Rare Helminthic Infestations 421  
K.V. Krishna Das, R.K. Shenoy  

SECTION 7  
FLUID AND ELECTROLYTES  

72. Abnormalities of Water and Electrolyte Balance 424  
R. Kasi Visweswaran  

73. Abnormalities of Acid-base Balance 434  
R. Kasi Visweswaran  

74. Disturbances of Osmotic Equilibrium 440  
K.V. Krishna Das, R. Kasi Visweswaran  

SECTION 8  
GASTROENTEROLOGY  

75. Digestive Organs: General Considerations 444  
K.R. Vinaya Kumar, K.V. Krishna Das  

76. Diseases of the Mouth and Tongue 455  
K.R. Vinaya Kumar, K.V. Krishna Das  

77. Diseases of the Esophagus 460  
K.R. Vinaya Kumar, K.V. Krishna Das  

78. Diseases of the Stomach 464  
K.R. Vinaya Kumar, K.V. Krishna Das  

79. Diseases of the Small Intestine 473  
K.R. Vinaya Kumar, K.V. Krishna Das  

80. Diseases of the Colon 484  
K.R. Vinaya Kumar, K.V. Krishna Das  

81. Diseases of the Peritoneum 491  
K.R. Vinaya Kumar, K.V. Krishna Das  

SECTION 9  
HEPATOBLIARY SYSTEM AND PANCREAS  

82. Hepatobiliary System: General Considerations 496  
K.R. Vinaya Kumar, K.V. Krishna Das  

83. Jaundice 498  
K.R. Vinaya Kumar, K.V. Krishna Das  

84. Cirrhosis 504  
K.R. Vinaya Kumar, K.V. Krishna Das  

85. Hepatic Failure 511  
K.R. Vinaya Kumar, K.V. Krishna Das  

86. Portal Hypertension 518  
K.R. Vinaya Kumar, K.V. Krishna Das  

87. Other Hepatic Disorders 523  
K.R. Vinaya Kumar, K.V. Krishna Das  

88. Diseases of the Gallbladder and the Major Bile Ducts 531  
K.R. Vinaya Kumar, K.V. Krishna Das  

89. Diseases of the Pancreas 534  
K.R. Vinaya Kumar, K.V. Krishna Das  

SECTION 10  
DIABETES MELLITUS, OTHER METABOLIC DISORDERS AND INHERITED DISORDERS OF CONNECTIVE TISSUE  

90. Diabetes Mellitus 544  
R.V. Jayakumar, A.G. Unnikrishnan, K.V. Krishna Das, K.P. Poulose  

91. Complications of Diabetes Mellitus 566  
R.V. Jayakumar, A.G. Unnikrishnan, K.V. Krishna Das, K.P. Poulose  

92. Fibrocalcific Pancreatic Diabetes and Other Causes of Melliturias 582  
K.V. Krishna Das, K.P. Poulose, R.V. Jayakumar, A.G. Unnikrishnan  

93. Other Metabolic Disorders 585  
K.V. Krishna Das  

94. Inherited Disorders of Connective Tissue 595  
K.V. Krishna Das  

SECTION 11  
ENDOCRINOLOGY  

95. Endocrinology: General Considerations 600  
K.P. Poulose, B. Jayakumar  

96. Hypothalamus, Pituitary and their Disorders 607  
K.P. Poulose, B. Jayakumar  

97. Pineal Gland and its Disorders 624  
K.P. Poulose, B. Jayakumar  

98. Thyroid and its Disorders 625  
K.P. Poulose, K.V. Krishna Das  

99. Parathyroids and their Disorders 642  
K.P. Poulose, B. Jayakumar
### SECTION 12
#### RHEUMATOLOGY

104. Disease of Locomotor System 686  
   K.V. Krishna Das

105. Rheumatoid Arthritis and its Variants 691  
   K.V. Krishna Das

106. Systemic Lupus Erythematosus, Antiphospholipid Antibody Syndrome 703  
   K.V. Krishna Das

107. Progressive Systemic Sclerosis (PSS) 709  
   K.V. Krishna Das

108. Systemic Vasculitis 713  
   K.V. Krishna Das

109. Polymyositis and Dermatomyositis 718  
   K.V. Krishna Das

110. Miscellaneous Rheumatic Syndromes 719  
   K.V. Krishna Das

111. Seronegative Spondyloarthopathies 721  
   K.V. Krishna Das

112. Metabolic Arthropathies 726  
   K.V. Krishna Das

113. Osteoarthrosis 732  
   K.V. Krishna Das

114. Other Bone Diseases 736  
   K.V. Krishna Das

### SECTION 13
#### CARDIOLOGY

115. Cardiology: General Considerations 742  
   C.G. Bahuleyan

116. Heart Failure 753  
   C.G. Bahuleyan

117. Shock 765  
   C.G. Bahuleyan

118. Congenital Heart Disease 768  
   S. Sivasankaran

119. Chronic Valvular Heart Diseases 782  
   C.G. Bahuleyan

120. Syphilitic Affection of Cardiovascular System 798  
   C.G. Bahuleyan

121. Infective Endocarditis 800  
   C.G. Bahuleyan

122. Cardiac Arrhythmias 806  
   K. Suresh

123. Systemic Hypertension 828  
   K. Suresh

124. Ischemic Heart Disease 842  
   C.G. Bahuleyan

125. Diseases of the Myocardium 864  
   C.G. Bahuleyan, K. Suresh

126. Diseases of the Pericardium 870  
   C.G. Bahuleyan

127. Cor Pulmonale 873  
   C.G. Bahuleyan

128. Diseases of the Aorta 876  
   C.G. Bahuleyan

129. Cardiac Surgery 880  
   C.G. Bahuleyan

130. Preventive Cardiology 883  
   C.G. Bahuleyan

### SECTION 14
#### RESPIRATORY SYSTEM

131. Respiratory System: General Considerations 886  
   C. Sudheendra Ghosh, Ronald Win B

132. Respiratory Failure 900  
   C. Sudheendra Ghosh, Ronald Win B

133. Diseases of the Upper Respiratory Tract 905  
   K.E. Rajan
<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>910</td>
<td>134.</td>
<td>Pneumonias</td>
<td>C. Sudheendra Ghosh, Ronald Win B</td>
</tr>
<tr>
<td>914</td>
<td>135.</td>
<td>Lung Abscess and Pleuropulmonary Amebiasis</td>
<td>C. Sudheendra Ghosh, Dinesa Prabhu V.</td>
</tr>
<tr>
<td>917</td>
<td>136.</td>
<td>Allergic Disorders of the Lung</td>
<td>K.E. Rajan</td>
</tr>
<tr>
<td>925</td>
<td>137.</td>
<td>Diseases of the Lower Airways</td>
<td>C. Sudheendra Ghosh, Dinesa Prabhu V.</td>
</tr>
<tr>
<td>934</td>
<td>138.</td>
<td>Occupational Lung Diseases</td>
<td>K.E. Rajan</td>
</tr>
<tr>
<td>937</td>
<td>139.</td>
<td>Pulmonary Fibrosis</td>
<td>C. Sudheendra Ghosh, Dinesa Prabhu V.</td>
</tr>
<tr>
<td>939</td>
<td>140.</td>
<td>Circulatory Disturbances in Lungs</td>
<td>C. Sudheendra Ghosh, Dinesa Prabhu V.</td>
</tr>
<tr>
<td>945</td>
<td>141.</td>
<td>Neoplasms of the Lung</td>
<td>C. Sudheendra Ghosh, Ronald Win B</td>
</tr>
<tr>
<td>951</td>
<td>142.</td>
<td>Pulmonary Cysts</td>
<td>C. Sudheendra Ghosh</td>
</tr>
<tr>
<td>952</td>
<td>143.</td>
<td>Pulmonary Involvement in Systemic Diseases</td>
<td>C. Sudheendra Ghosh, Dinesa Prabhu V.</td>
</tr>
<tr>
<td>955</td>
<td>144.</td>
<td>Diseases of Pleura</td>
<td>C. Sudheendra Ghosh, Dinesa Prabhu V.</td>
</tr>
<tr>
<td>961</td>
<td>145.</td>
<td>Diseases of the Chest Wall</td>
<td>K.E. Rajan</td>
</tr>
<tr>
<td>964</td>
<td>146.</td>
<td>Diseases of the Diaphragm</td>
<td>K.E. Rajan</td>
</tr>
<tr>
<td>967</td>
<td>147.</td>
<td>Diseases of the Mediastinum</td>
<td>C. Sudheendra Ghosh, Dinesa Prabhu V.</td>
</tr>
<tr>
<td>970</td>
<td>148.</td>
<td>Hematology: General Considerations</td>
<td>K.V. Krishna Das</td>
</tr>
<tr>
<td>984</td>
<td>149.</td>
<td>Anemias: General Considerations</td>
<td>K.V. Krishna Das</td>
</tr>
<tr>
<td>989</td>
<td>150.</td>
<td>Nutritional and Other Anemias</td>
<td>K.V. Krishna Das</td>
</tr>
<tr>
<td>998</td>
<td>151.</td>
<td>Hemolytic Anemias</td>
<td>K.V. Krishna Das</td>
</tr>
<tr>
<td>1015</td>
<td>152.</td>
<td>Anemias Characterized by Defective Erythrocyte Production</td>
<td>K.V. Krishna Das</td>
</tr>
<tr>
<td>1021</td>
<td>153.</td>
<td>Blood Transfusion</td>
<td>K.V. Krishna Das</td>
</tr>
<tr>
<td>1028</td>
<td>154.</td>
<td>Leukemias: General Considerations and Acute Leukemias</td>
<td>K.V. Krishna Das, Mathew Thomas</td>
</tr>
<tr>
<td>1042</td>
<td>155.</td>
<td>Chronic Leukemias</td>
<td>P.K. Sasidharan, K.V. Krishna Das</td>
</tr>
<tr>
<td>1050</td>
<td>156.</td>
<td>Myelodysplastic Syndrome</td>
<td>K.V. Krishna Das</td>
</tr>
<tr>
<td>1054</td>
<td>157.</td>
<td>Agranulocytosis (Severe Neutropenia)</td>
<td>P.K. Sasidharan, K.V. Krishna Das</td>
</tr>
<tr>
<td>1056</td>
<td>158.</td>
<td>Plasma Cell Dyscrasias</td>
<td>K.V. Krishna Das, Mathew Thomas</td>
</tr>
<tr>
<td>1063</td>
<td>159.</td>
<td>Malignant Disorders of Lymphoid Cells</td>
<td>K.V. Krishna Das, Mathew Thomas</td>
</tr>
<tr>
<td>1070</td>
<td>160.</td>
<td>Myeloproliferative Disorders</td>
<td>P.K. Sasidharan, K.V. Krishna Das</td>
</tr>
<tr>
<td>1074</td>
<td>161.</td>
<td>Spleen and Its Disorders</td>
<td>K.V. Krishna Das, P.K. Sasidharan</td>
</tr>
<tr>
<td>1076</td>
<td>162.</td>
<td>Hemostasis: General Considerations</td>
<td>Mathew Thomas, K.V. Krishna Das</td>
</tr>
<tr>
<td>1083</td>
<td>163.</td>
<td>Platelet and Vascular Disorders</td>
<td>K.V. Krishna Das, Mathew Thomas</td>
</tr>
<tr>
<td>1091</td>
<td>164.</td>
<td>Defects of Coagulation</td>
<td>Mathew Thomas, K.V. Krishna Das</td>
</tr>
<tr>
<td>1098</td>
<td>165.</td>
<td>Therapeutics of Anticoagulants</td>
<td>Mathew Thomas, K.V. Krishna Das</td>
</tr>
<tr>
<td>1102</td>
<td>166.</td>
<td>Disseminated Intravascular Coagulation, Microangiopathic Hemolytic States</td>
<td>K.V. Krishna Das, Mathew Thomas</td>
</tr>
<tr>
<td>1105</td>
<td>167.</td>
<td>Thrombophilia</td>
<td>K.V. Krishna Das, Mathew Thomas</td>
</tr>
</tbody>
</table>
## SECTION 16
### NEPHROLOGY

168. Structure and Function of the Kidneys and Urinary Tract 1108
   Susan Uthup

169. Clinical Approach—Evaluation and Investigations 1113
   Jacob George

170. Glomerulonephritis 1122
    R. Kasi Visweswaran, Ramdas Pisharody

171. Tubulointerstitial Nephritis 1131
    A. Vimala

172. Urinary Tract Infection 1135
    A. Vimala, Susan Uthup

173. Nephrolithiasis 1137
    A. Vimala, Susan Uthup

174. Kidney in Systemic Diseases 1140
    M. Thomas Mathew

175. The Kidney and Hypertension 1146
    S. Krishnakumar, Jacob George

176. Pregnancy and Medical Disorders 1149
    Jacob George

177. Urinary Tract Obstruction 1155
    R. Kasi Visweswaran, Susan Uthup

178. Acute Renal Failure 1157
    Ramdas Pisharody

179. Chronic Kidney Disease 1161
    Ramdas Pisharody

180. Renal Replacement Therapy 1168
    Ramdas Pisharody, M. Sreelatha

181. Drugs and the Kidney 1173
    Jacob George

## SECTION 17
### NEUROLOGY

182. Nervous System: General Considerations 1178
    S.R. Chandra, P.K. Mohan

183. Neurological Examination and Investigations 1186
    S.R. Chandra, P.K. Mohan

184. Cranial Nerves 1200
    S.R. Chandra, P.K. Mohan

185. Coma and Brain Death 1215
    S.R. Chandra, P.K. Mohan

186. Headache 1220
    A.S. Girija, P.K. Mohan

187. Nutritional Disorders of the Nervous System 1224
    Jalesh N. Panicker, P.K. Mohan, K.V. Krishna Das

188. Infections of the Central Nervous System 1227
    Jalesh N. Panicker, P.K. Mohan, K.V. Krishna Das

189. Dementias and Metabolic Encephalopathy 1237
    A.S. Girija, P.K. Mohan

190. Epilepsies 1241
    A.S. Girija, P.K. Mohan

191. Involuntary Movements and Diseases of the Extrapyramidal System 1254
    Asha Kishore

192. Miscellaneous Extrapyramidal Syndromes 1265
    P.K. Mohan, K.V. Krishna Das

193. Cerebrovascular Diseases 1267
    S.R. Chandra, P.K. Mohan

194. Intracranial Space Occupying Lesions 1280
    Ananda Kumar, P.K. Mohan

195. Multiple Sclerosis and Other Demyelinating Lesions 1289
    Ananda Kumar, P.K. Mohan

196. Motor Neuron Disease 1295
    S.R. Chandra, P.K. Mohan

197. Diseases of the Cerebellum 1298
    Ananda Kumar, P.K. Mohan

198. Diseases of the Spinal Cord, Nerve Roots and Plexus 1303
    Jalesh N. Panicker, P.K. Mohan

199. Diseases of the Vertebral Column Causing Neurological Lesions 1315
    Ananda Kumar, P.K. Mohan

200. Diseases of the Peripheral Nervous System 1321
    Ananda Kumar, P.K. Mohan

201. Autonomic Nervous System 1328
    S.R. Chandra, P.K. Mohan, K.V. Krishna Das

202. Myasthenias 1332
    A.S. Girija, P.K. Mohan

203. Diseases of Muscles 1335
    A.S. Girija, P.K. Mohan
SECTION 18
DERMATOLOGY

204. Skin: General Considerations 1344
   Usha Vaidhyanathan

205. Infections of the Skin and Appendages 1348
   Usha Vaidhyanathan

206. Skin Infestations 1357
   Usha Vaidhyanathan

207. Acne and Rosacea 1359
   Usha Vaidhyanathan

208. Papulosquamous Disorders 1361
   Usha Vaidhyanathan

209. Eczema 1368
   Usha Vaidhyanathan

210. Vesiculo Bullous Disorders 1374
    Pradeep S. Nair

211. Urticaria and Angioedema 1377
    Pradeep S. Nair

212. Cutaneous Drug Reactions 1379
    Pradeep S. Nair

213. Disorders of Blood Vessels and Lymphatics 1382
    Pradeep S. Nair

214. Disorders of Pigmentation 1384
    Pradeep S. Nair

215. Disorders of Hair and Nails 1386
    Pradeep S. Nair

216. Disorders of Elastin and Collagen Fibers 1389
    Pradeep S. Nair

217. Cutaneous Manifestations of Systemic Disorders 1390
    Pradeep S. Nair

218. Skin Tumours 1393
    Pradeep S. Nair

SECTION 19
PSYCHIATRY

219. Basic Concepts 1398
    N. Krishnan Kutty

220. Organic Mental Disorders 1405
    N. Krishnan Kutty

221. Schizophrenia and Delusional Disorders 1407
    N. Krishnan Kutty

222. Mood Disorders: Mania, Depression, Dysthymia 1410
    N. Krishnan Kutty

223. Anxiety Disorders 1413
    N. Krishnan Kutty

224. Obsessive-compulsive Disorders 1415
    N. Krishnan Kutty

225. Conversion Disorders, Dissociative Disorders, Somatoform Disorders, Cultural Bond Syndromes, Reaction to Stress and Adjustment Disorders 1416
    N. Krishnan Kutty

226. Torture 1419
    N. Krishnan Kutty

227. Disorders of Adult Personality 1420
    N. Krishnan Kutty

228. Psychoactive Substance Use Disorders and Alcohol-related Disorders 1421
    N. Krishnan Kutty

229. Behavioral Syndromes Associated with Physiological Disturbances and Physical Factors 1423
    N. Krishnan Kutty

230. Psychological Factors Affecting Systemic Medical Disorders 1426
    N. Krishnan Kutty

231. Mental Retardation 1428
    N. Krishnan Kutty

232. Behavioral and Emotional Disorders Occurring in Childhood and Adolescence 1429
    N. Krishnan Kutty

233. Psychiatric Emergencies 1431
    N. Krishnan Kutty

234. General Principles of Management of Psychiatric Disorders 1432
    N. Krishnan Kutty

235. Psychological Methods of Treatment (Psychotherapy) 1438
    N. Krishnan Kutty

236. Psychiatric Disorders Special to Childhood 1440
    N. Krishnan Kutty

Index ................................................................. 1443