IN THEIR ESTEEMED OPINION.....

Prof NS Tibrewala (Mumbai) : *"... occupies pride of the place as a standard textbook... an indispensable companion..."*

Prof PM Udani (Mumbai) : *"An essential reading... a nice work."*

Prof NR Bhandari (Bhopal) : *"A great gift to the students, both undergraduates and postgraduates."*

Prof DG Benakappa (Bangalore) : *"Very comprehensive and up-to-date...highly recommended."*

Prof N Sundravalli (Chennai) : *"A work of special merit."*

Prof AB Desai (Ahmedabad) : *"...effectively worded and illustrated, and of great value."*

Prof K Indira Bai (Annamalai) : *"Comprehensive...extremely well written... ideal... strongly recommended."*

Prof Meharban Singh (Noida) : *"Very informative."*

Prof GP Mathur (Kanpur) : *"Very useful for undergraduates, postgraduates and practitioners."*

Prof PK Misra (Lucknow) : *"A very nice comprehensive textbook."*

Prof K Kalra (Agra) : *"Strongly recommended to undergraduates and postgraduates."*

Prof Pinaki Banerjee (Kolkata) : *"A very comprehensive book...ideal for students."*

Prof SS Deshmukh (Nagpur) : *"...fulfills a long awaited need... wonderful... very comprehensive."*

Prof Rafiq Ahmed (Kolkata) : *"A book of outstanding merit."*

Prof KPS Sinha (Patna) : *"A fine and appreciable work... clinical approach is commendable."*

Prof SK Khetarpal (Amritsar) : *"Concise, comprehensive, up-to-date and to the point...."*

Prof PS Mathur (Gwalior) : *"Warmly recommended."*

Prof P Chaturvedi (Sewagram) : *"Very helpful to students."*

Prof Birendra Kumar (Darbhanga) : *"A really very useful and precise volume for students."*

Prof BK Garg (Meerut) : *"Ideal for students."*

Prof Shanta Karup (Kottayam) : *"A very good work."*

Prof Ananthakrishna (Chennai) : *"Excellent...covers every aspect of pediatrics."*

Prof NB Mathur (Sewagram) : *"Highly useful...strongly recommended."*

Prof AK Dikshit (Jamshedpur) : *"The book fulfills a very long-standing need."*

Prof AV Ramana (Warangal) : *"Very useful for students as well as practitioners."*

Prof SP Srivastava (Patna) : *"Very up-to-date, comprehensive and appropriate for our students, both under- and postgraduates....."*

Prof Neetu Raizada (Ludhiana) : *"A highly recommended state-of-the-art textbook... an essential reading."*

Prof B Sharda (Udaipur) : *"Most comprehensive and state-of-the-art textbook..."*

Prof Madhuri Kulkarni (Mumbai) : *"... tailor-made to the needs of the students."*

Prof A Parthasarthy (Chennai) : *"A prototype of Nelson Textbook of Pediatrics.... modelled as per requirements in India..."*

Prof AM Sur (Nagpur) : *"... a boon for pediatric scholars in India in particular... warmly recommended."*

Prof Utpal Kant Singh (Patna) : *"...profusely illustrated, clinical-oriented, most uptodate and ideal to meet the needs of students in India in particular."*

Prof BS Prajapati (Ahmedabad) : *"An essential reading for all students of pediatrics... carries valuable information including much-sought-after statistical data... useful for teachers too."*

Prof VN Tripathi (Kanpur) : *"A meritorious work...most suitable for undergraduates in particular and postgraduates in general."*

Prof Javed Chowdhary (Srinagar) : *"A textbook of extraordinary merit...An essential reading for the undergraduates as well as postgraduates..."*

Prof Masood-ul-Hassan (Srinagar) : *"Most uptodate, well-illustrated, clinical-oriented, very comprehensive and student-friendly textbook... warmly recommended."*

Prof Praveen C Sobti (Ludhiana) : *"For over 3 decades, Dr Suraj Gupte's textbook has been popular with undergraduates and postgraduates alike. The book contains all that the students need to know about common childhood illnesses in the developing world. It is a thoroughly readable book."*

Prof Vijay Sharma (Shimla) : *"A highly recommended textbook of pediatrics.."*

Prof DB Sharma (Jammu) : *"Tailor-made for the needs of students in India...strongly recommended."*

Prof (Col) VS Puri (Jammu) : *"An outstanding clinical-oriented textbook... most useful... warmly recommended."*

Prof Pankaj Abrol (Rohtak) : *"A very comprehensive and up-to-date textbook of Pediatrics... a nice Indian response to Nelson's Textbook of Pediatrics... can easily compete with best textbooks of pediatrics... A "must" for all students of pediatrics in India."*

Prof MMA Faridi (Delhi) : *"There are many books around in the specialty but The Short Textbook of Pediatrics is unique...it makes the subject easy, interesting and understandable."*

Prof Rekha Harish (Jammu) : *"This textbook of extraordinary merit eminently meets the requirements of students, especially the undergraduates, and is warmly recommended..."*

Prof B Vishnu Bhat (Pondicherry) : *"Well-written book covering all information needed by undergraduates and postgraduates in pediatrics. Good reference book for practising pediatricians as well..."*

Prof Ajay Gaur (Gwalior) : *"…a genuinely good book for the undergraduate and postgraduate students with the expertise of eminent academicians… The contents are well presented in a uniform style and in keeping with the standard protocols and guidelines.... ."*

Prof Ghanshyam Saini (Jammu) : *"…an extraordinary work... a very useful tool for the undergraduates, postgraduates and academicians."*

Prof RK Gupta (Jammu) : *"An excellent textbook, full of latest updates… unique in itself, providing concise but comprehensive information …. invaluable in pediatric education for the undergraduates and postgraduates.''*

Prof E Chen (Malaysia) : *"A complete textbook on tropical pediatrics…a "must possession" by each and every student of pediatrics in the region."*

Prof Shaukat Sidiqui (Pakistan) : *"Most valuable for the pediatric UGs, PGs, teaching faculty and practising pediatricians as also for the GPs treating infants, children and adolescents in the subcontinent…"*

Prof RN Koirala (Nepal) : *"An exceptionally useful textbook of pediatrics, eminently meeting the needs of our students and their teachers…most suitable for our settings."*

Prof JE Jaywardne (Sri Lanka) : *"A warmly recommended pediatric textbook, focusing exactly on what is needed by our medical students, emerging pediatricians and teachers…"*

Prof AQ Bhashani (Bangladesh) : *"The textboook is a spotlight on everything that we need to teach our students of pediatrics in Bangladesh and neighboring countries…"*

THE SHORT TEXTBOOK OF PEDIATRICS

THE SHORT TEXTBOOK OF PEDIATRICS

11th Edition

(Fourth Decade of Publication)

Incorporating National and International Recommendations (MCI, IAP, NNF, WHO, UNICEF, IPA, ISTP, AAP, etc)

Edited by

Suraj Gupte MD, FIAP

Professor and Head

Postgraduate Department of Pediatrics

Narayana Medical College/Narayana General and Superspeciality Hospitals

Nellore 524 002, AP, South India

E-mail: surajgupte@rediffmail.com

recentadvances@yahoo.co.uk

Honorary Director: Pediatric Education Network

Editor: Recent Advances in Pediatrics (Series), Textbooks of Pediatric Emergencies, Neonatal Emergencies and Pediatric Nutrition, Pediatric Gastroenterology, Hepatology and Nutrition, Towards MRCPCH Part II (Theory Examination), Pediatric Yearbook (Series), Newer Horizons in Tropical Pediatrics, etc.

Author: Differential Diagnosis in Pediatrics, Instructive Case Studies in Pediatrics, Pediatric Drug Directory, Infant Feeding, Speaking of Child Care, The Baby Book: The Parents' Guide from Birth to Infancy

Co-editor: Asian Journal of Maternity and Child Health (Manila, Philippines)

Section and Guest Editor: Pediatric Today (New Delhi)

Editorial Advisor: Asian Journal of Pediatric Practice (New Delhi)

Editorial Advisory Board Member/Reviewer: Indian Journal of Pediatrics (New Delhi), Indian Pediatrics (New Delhi), Synopsis (Detroit, USA), Indian Journal of Pediatric Gastroenterology, Hepatology and Nutrition (Jaipur), Maternal and Child Nutrition (Preston, UK), Journal of Infectious Diseases (Turkey)

Examiner: National Board of Examinations (NBE) for DNB, New Delhi; All India Institute of Medical Sciences (AIIMS), New Delhi; Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh; Sher-i-Kashmir Institute of Medical Sciences (SKIMS), Srinagar; Indira Gandhi Open University (IGNOU), New Delhi

Pediatric Faculty Selection Expert: All India Institute of Medical Sciences (AIIMS), Punjab Public Service Commission, Jammu and Kashmir Public Service Commission, Union Public Service Commission

JAYPEE BROTHERS MEDICAL PUBLISHERS (P) LTD

New Delhi • Ahmedabad • Bengaluru • Chennai • Hyderabad • Kochi • Kolkata • Lucknow • Mumbai • Nagpur • St. Louis (USA)

Published by
Jitendar P Vij
Jaypee Brothers Medical Publishers (P) Ltd
Corporate Office
4838/24 Ansari Road, Daryaganj, **New Delhi** - 110002, India, Phone: +91-11-43574357
Registered Office
B-3 EMCA House, 23/23B Ansari Road, Daryaganj, **New Delhi** - 110 002, India
Phones: +91-11-23272143, +91-11-23272703, +91-11-23282021
+91-11-23245672, Rel: +91-11-32558559, Fax: +91-11-23276490, +91-11-23245683
e-mail: jaypee@jaypeebrothers.com, Visit our website: www.jaypeebrothers.com

Branches

- 2/B, Akruti Society, Jodhpur Gam Road Satellite
  Ahmedabad 380 015, Phones: +91-79-26926233, Rel: +91-79-32988717
  Fax: +91-79-26927094, e-mail: ahmedabad@jaypeebrothers.com
- 202 Batavia Chambers, 8 Kumara Krupa Road, Kumara Park East
  Bengaluru 560 001, Phones: +91-80-22285971, +91-80-22382956
  91-80-22372664, Rel: +91-80-32714073, Fax: +91-80-22281761
  e-mail: bangalore@jaypeebrothers.com
- 282 IIIrd Floor, Khaleel Shirazi Estate, Fountain Plaza, Pantheon Road
  Chennai 600 008, Phones: +91-44-28193265, +91-44-28194897
  Rel: +91-44-32972089, Fax: +91-44-28193231,
  e-mail: chennai@jaypeebrothers.com
- 4-2-1067/1-3, 1st Floor, Balaji Building, Ramkote Cross Road,
  Hyderabad 500 095, Phones: +91-40-66610020, +91-40-24758498
  Rel:+91-40-32940929 Fax:+91-40-24758499
  e-mail: hyderabad@jaypeebrothers.com
- No. 41/3098, B & B1, Kuruvi Building, St. Vincent Road
  Kochi 682 018, Kerala, Phones: +91-484-4036109, +91-484-2395739
  +91-484-2395740 e-mail: kochi@jaypeebrothers.com
- 1-A Indian Mirror Street, Wellington Square
  Kolkata 700 013, Phones: +91-33-22651926, +91-33-22276404
  +91-33-22276415, Rel: +91-33-32901926, Fax: +91-33-22656075
  e-mail: kolkata@jaypeebrothers.com
- Lekhraj Market III, B-2, Sector-4, Faizabad Road, Indira Nagar
  Lucknow 226 016 Phones: +91-522-3040553, +91-522-3040554
  e-mail: lucknow@jaypeebrothers.com
- 106 Amit Industrial Estate, 61 Dr SS Rao Road, Near MGM Hospital, Parel
  Mumbai 400 012, Phones: +91-22-24124863, +91-22-24104532,
  Rel: +91-22-32926896, Fax: +91-22-24160828
  e-mail: mumbai@jaypeebrothers.com
- "KAMALPUSHPA" 38, Reshimbag, Opp. Mohota Science College, Umred Road
  Nagpur 440 009 (MS), Phone: Rel: +91-712-3245220, Fax: +91-712-2704275
  e-mail: nagpur@jaypeebrothers.com

USA Office
1745, Pheasant Run Drive, Maryland Heights (Missouri), MO 63043, USA, Ph: 001-636-6279734
e-mail: jaypee@jaypeebrothers.com, anjulav@jaypeebrothers.com

The Short Textbook of Pediatrics, 11th Edition

© 2009, Suraj Gupte, Editor

All rights reserved. No part of this publication should be reproduced, stored in a retrieval system, or transmitted in any form or by any means: electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the editor and the publisher.

This book has been published in good faith that the material provided by the contributors is original. Every effort is made to ensure accuracy of material, but the publisher, printer and editor will not be held responsible for any inadvertent error(s). In case of any dispute, all legal matters to be settled under Delhi jurisdiction only.

First Edition : 1977
Second Edition : 1979
Third Edition : 1982
Fourth Edition : 1983
Fifth Edition : 1985
Sixth Edition : 1989
Seventh Edition : 1995
Eighth Edition : 1998
Ninth (Millennium) Edition : 2001
Tenth (Silver Jubilee) Edition: 2004
Eleventh (Fourth Decade of Publication) Edition: **2009**

ISBN 978-81-8448-469-4

Typeset at JPBMP typesetting unit
Printed at Gopsons Papers Ltd., A-14, Sector 60, Noida

To
The fond memory of my parents
whose inspiration, motivation, blessings
and moral support continue to contribute a great
deal to my academic endeavors
and
everybody striving to contribute to child health
and welfare for a brighter future
globally.

Contributors

RA Anderson
Professor
Department of Pediatric Gastroenterology, Hepatology and Nutrition, Institute of Child and Adolescent Health
London, UK
Ch 24: Pediatric Gastroenterology
Ch 25: Pediatric Hepatology

Lalita Bahl
Ex-Professor and Head
Department of Pediatrics
Indira Gandhi Medical College
Shimla, India
Ch 16: Fluids, Electrolytes and Acid-base Balance and Its Disturbances
Ch 46: Pediatric Drug Dosages

Surya Bhan
Professor
Department of Orthopedics
All India Institute of Medical Sciences
New Delhi, India
Ch 41: Pediatric Orthopedics

B Vishnu Bhat
Director-Professor
Department of Pediatrics
Jawaharlal Institute of Postgraduate Medical Education and Research, Pondicherry, India
Ch 36: Pediatric Neuromuscular Disorders

Jagdish Chandra
Professor
Kalawati Saran Children's Hospital
Lady Hardinge Medical College
New Delhi, India
Ch 27: Pediatric Hematology

Mridula Chatterjee
Professor and Head
Pediatric Department
North Bengal Medical College
Kadamtala, Siliguri, West Bengal, India
Ch 8: Pediatric Biostatistics and Informatics

Aniece Chowdhary
Professor and Head
Department of ENT and Head and Neck Surgery
Government Medical College/SMGS Hospital
Jammu, Jammu and Kashmir, India
Ch 38: Pediatric Ear, Nose and Throat (ENT) Problems

Bhavna B Chowdhary
Lecturer
School of Medical Studies
Edinburgh, UK
Ch 23: Pediatric Neurology
Ch 44: Pediatric Laboratory Procedures

Javed Chowdhary
Professor and Head
Department of Pediatrics
Government Medical College
Srinagar, Jammu and Kashmir, India
Ch 17: Neonatology

S Frank
Professor and Head
Department of Immunology and Genetics
Institute of Child and Adolescent Health
London, UK
Ch 29: Pediatric Immunology
Ch 35: Genetics in Pediatric Practice

EM Gomez
Associate Clinical Professor
Department of Infant and Child Nutrition
Institute of Child and Adolescent Health
London, UK
Ch 3: Growth and Development
Ch 12: Infant Feeding
Ch 13: Protien-energy Malnutrition

AM Graham
Clinical Professor
Center for Hemato-oncology
Boston, Massachusetts, USA
Ch 28: Pediatric Oncology

Devendra Gupta
Professor and Head
Department of Pediatric Surgery
All India Institute of Medical Sciences (AIIMS)
New Delhi, India
Ch 40: Pediatric Surgery

Suraj Gupte
Professor and Head
Postgraduate Department of Pediatrics
Narayana Medical College/Narayana General and Superspeciality
Hospitals, Nellore, South India
Chapters: All chapters as senior or coauthor

BP Karunakara
Assistant Professor
Department of Pediatrics
MS Ramaiah Medical College/Teaching Hospital
Bangalore, Karnataka, India
Ch 22: Pediatric Cardiology

RK Kaushal
Professor and Head
Department of Pediatrics
Indira Gandhi Medical College
Shimla
Ch 32: Pediatric Accidental Poisoning
Ch 33: Pediatric Envenomations

AW Koff
Professor, Department of Pediatric Endocrinology
Institute of Child and Adolescent Health
London, UK
Ch 34: Pediatric Endocrinology

ML Kulkarni
Professor and Head
Department of Pediatrics
JJM Medical College
Davangere, Karnataka, India
Ch 29: Pediatric Immunology

PP Maiya
Professor and Head
Department of Pediatrics
MS Ramaiah Medical College/Teaching Hospital
Bangalore, Karnataka, India
Ch 22: Pediatric Cardiology

NK Nagpal
Assistant Professor
Department of Dental and Orofacial Surgery
Institute of Child and Adolescent Health
London, UK
Ch 39: Pediatric Dental Problems

NE Parsons
Clinical Professor
Department of Dermatology
Institute of Child and Adolescent Health
London, UK
Ch 31: Pediatric Dermatology

AK Sahni
Assistant Professor
Department of Adolescent Medicine
Institute of Child and Adolescent Health
London, UK
Ch 7: Adolescence

DM Sharma
Assistant Professor
Department of Rheumatology
Institute of Child and Adolescent Health
London, UK
Ch 30: Pediatric Collagenosis

RM Shore
Assistant Professor
Department of Nephrology
Institute of Child and Adolescent Health
London, UK
Ch 26: Pediatric Nephrology

Daljit Singh
Principal
Dayanand Medical College
Ludhiana, Punjab, India
Ch 21: Pediatric Pulmonology

Karnail Singh
Professor and Head
Department of Pediatrics
Government Medical College
Amritsar, Punjab, India
Ch 19: Pediatric Bacterial Infections

Ksh Chourjit Singh
Ex-Professor and Head
Department of Pediatrics
North-East Regional Medical College
Imphal, Manipur, India
Ch 18: Pediatric Viral Infections

Tejinder Singh
Professor and Head
Department of Pediatrics
Christian Medical College
Ludhiana, Punjab, India
Ch 6: Child Psychiatry and Behavioral Problems
Ch 9: Community Pediatrics

Utpal Kant Singh
Professor and Head
Department of Pediatrics
Nalanda Medical College
Patna, Bihar
India
Ch 20: Pediatric Parasitosis

Rita Smith
Director-Professor of Pediatrics
Institute of Child and Adolescent Health
London, UK
Ch 1: Pediatric History-taking and Clinical Examination

Praveen C Sobti
Professor and Head of the Unit
Department of Pediatrics
Dayanand Medical College
Ludhiana, Punjab
India
Ch 27: Pediatric Hematology

Shashi Vani
Professor and Head
Department of Pediatrics
PS Medical College
Karamsad, Anand, Gujarat, India
Ch 11: Pediatric Nutritional Requirements
Ch 17: Neonatology

Vasudev Vatwani (Brig)
Professor and Head
Department of Pediatrics
Dr DY Patil Medical College
Pimpri, Pune, Maharashtra, India
Ch 43: Pediatric Practical Procedures

Vijay Wali
Ex-Professor and Head
Department of Ophthalmology
Government Medical College
Jammu, Jammu and Kashmir, India
Ch 37: Pediatric Ophthalmology

Foreword

It gives me great pleasure to write this Foreword to the 11th edition of *The Short Textbook of Pediatrics* edited by Dr Suraj Gupte. He is a recognized pediatric academician, researcher, innovator and educationist of our country and is keenly interested in writing—not only on medical subjects, but also diverse areas, including fiction. He was the recipient of the 1976-Wodehouse Award for his *The Last Summer.* He was the first Indian and the youngest ever to receive this international award.

The Short Textbook of Pediatrics, the first Indian textbook of pediatrics, is written in a simple and fluent language. It gives useful information on the problems of child health in our country and, in brief, a clear concept of the subject. The chapters on growth and development, infant feeding, micronutrient/mineral deficiencies, infections and infestations, immunization, diarrheas, neonatology, immunology and many others are particularly very relevant to our country. The students and teachers of medicine will do well to go through the same carefully. Comprehensiveness is an outstanding feature of this book.

In India, in spite of the country's advances in the field of pediatrics, there is a dearth of well-written textbooks on pediatrics for the use of undergraduates. In recent years, child health has assumed great significance in our country. Today, its importance is being realized more and more by the medical educators, the students and the general public. Of late, the Medical Council of India (MCI) has made "pediatrics" a major and an examination discipline in undergraduate curriculum. It is in the fitness of things that textbooks satisfying the requirements of our country are brought out on the subject. This book, by virtue of its simplicity, flow of language, excellent material and useful statistical data, fulfills this lacuna eminently. At the same time, it is fully in accordance with the syllabus/curriculum recommended by the Indian Academy of Pediatrics (IAP) and finally approved and adopted by the Medical Council of India (MCI).

I am happy that the textbook has been exceedingly well received by the medical professionals, especially the undergraduate medical community of India and other developing countries, ever since it was first published in 1977. Today, it occupies "pride of the place" as a standard textbook in India and several other countries of South-East Asia.

The strategic changes affected in the 10th edition, rendering the book as multiauthor, to meet the requirements of the Medical Council of India (MCI) that had given pediatrics the status of an independent subject at the university level, further enhanced its popularity, acceptability and utility.

I am very confident that the 11th edition of *The Short Textbook of Pediatrics* ("STP" as it is popularly known as) shall be yet more successful and record its significant contribution in improving the standard of pediatric education and child health care in the Indian subcontinent in particular and the developing world in general.

Rungta House
68A, Nepean Sea Road
Mumbai-400 006

Prof NS Tibrewala
MD DCH D PED FCCP (USA)
President, XV International Congress of Pediatrics
Hon. Pediatrician, Bombay Hospital, Mumbai
Past President, Indian Academy of Pediatrics
Chairman, Board of Studies in Medicine and Allied Subjects, University of Bombay, 1970-75
Ex-Director/Professor, Dept. of Pediatrics, TN Medical College and BYL Nair Hospital, Mumbai
Maharashtra (India)

Preface to the Eleventh Edition

The 11th edition of *The Short Textbook of Pediatrics* appears at a time when pediatrics has well established its status as an independent subject in the undergraduate curriculum with a separate examination at university level in India. Since the last edition eminently succeeded in meeting the needs of the undergraduate students, here we have made further strides to attain the enhanced excellence not only for them but also for the benefit of postgraduates, residents, practitioners and teachers. The goal is to provide a blend of time-honored concepts along with new advances with special emphasis on the needs in the Indian subcontinent.

Each and every chapter stands updated with extensive revisions and/or rewriting, reorganization and additional material, including new chapters and new illustrations in keeping with the changing needs. Naturally, the Index is further expanded. As a result, the new edition is yet more reader-friendly, state-of-the-art and practical-oriented. Yet, the hallmarks of the earlier editions, namely brevity with comprehensiveness, simple and straight-forward style and easy-to-understand expression have been retained and, in fact, further strengthened.

Admittedly, the unique and enhanced value of the 11th edition is very much on account of the expertise, hard work and command in the respective fields of the distinguished contributors. My hats off to them!

Over and above the learned contributors, a multitude of colleagues, friends and readers, in India and abroad, made worthy suggestions for enhancing the utility of the book. Informed assistance from the faculty of the Postgraduate Department of Pediatrics, Narayana Medical College and Hospitals, especially, Dr CM Kumar, is particulary acknowledged. The Chairman, Dr P Narayana, the Adviser, Dr CL Venkata Rao, the Medical Superintendent, Dr JN Rao and Vice-Principal and Coordinator, Dr S Vijay Kumar were gracious enough to provide moral support and motivation in completing this project.

My wife, Shamma, graciously assisted me so much in taking the project to its logical conclusion. So did my daughter, Dr Novy, and son, Er Manu, in spite of their preoccupations.

Prof (Dr) NS Tibrewala, now a legend in the pediatric circles, has once again been gracious enough to write *Foreword* to this edition.

Last but not the least, I wish to thank M/s Jaypee Brothers Medical Publishers (P) Ltd and their dedicated staff for the skillfull production qualities of the 11th edition.

SURAJ GUPTE MD, FIAP
Professor and Head
Postgraduate Department of Pediatrics
Narayana Medical College/Narayana General and
Superspeciality Hospitals, Nellore, South India

Preface to the First Edition

"Whyn't a handy pediatric book for our students?"-Requests like this virtually flooded me as I was in the thick of editing the *Newer Horizons in Tropical Pediatrics* last year. Today, I am glad to offer that much-demanded work in the form of *The Short Textbook of Pediatrics.*

The Short Textbook of Pediatrics is aimed at providing a concise, simple and profusely-illustrated digest of the contemporary pediatrics, relevant to the developing world. Common tropical problems, such as nutritional deficiencies, diarrheas, tuberculosis and other frequent infections and parasitic infections and immunization, have received special attention. Certain areas that are important to us but have been ignored by the western authors are, in particular, dealt with. Indian childhood cirrhosis, infantile tremor syndrome, primary bladder stone disease, BCG as a diagnostic tool and tuberculous encephalopathy figure in this list. The accent is on priorities, clinical aspects and latest information rather than on rare conditions and outdated theoretical discussion.

The book is addressed primarily to the medical students, new entrants to the specialty of pediatrics and practising physicians who deal with infants and children as well. Some material especially the statistical data and up to date reference—some as latest as of 1977—are likely to be of value to the seniors either. How far have I succeeded in my endeavors? In this behalf, I would love to have your assessment. That shall help me to make up the deficiencies and introduce the "necessary changes for the better" in the future edition.

The publisher, Mr Jitendar P Vij of M/s Jaypee Brothers Medical Publishers (P) Ltd., and the Managing Editor, Rajendra Gupte's contributions have been vital to the appearance of this manual.

Much of the material included in *The Short Textbook of Pediatrics* is based on articles in the recent WHO/UNICEF publications, *Indian Journal of Pediatrics, Indian Pediatrics, Indian Practitioner* and other Indian and foreign periodicals and books. I have punctuated the accounts with our own observations at the prestigious Postgraduate Institute of Medical Education and Research, Chandigarh, HP Medical College, Shimla, and Govt. Medical College, Jammu. The superb teaching of Prof BNS Walia, Dr (Mrs) Saroj Mehta, Dr ON Bhakoo, Dr SK Mehta, Dr (Mrs) A Perkash and Col ML Magotra has proved to be a source of guidance and stimulation in preparing this book.

Hats off to many of my past and present colleagues, friends and well-wishers for lots of good-will, ideas and cooperation; Dr JC Lall, Dr RK Chaudhary, Dr (Miss) Kalpana Kohli, Dr (Miss) Rita Malhotra, Dr Vinod Seth, Mrs Neelam Virmani, Mr Ayudhia Kaul and Mr GS Malhotra deserve a special mention. Dr Satish Gupte, Dr (Miss) Prem Gupte and Miss Shamma Bakshi extended enthusiastic assistance in preparing the manuscript, proof-reading and indexing.

Major (Mrs) BK Sohi and Lt. Col AS Sohi have been exceedingly courteous in making available a number of excellent clinical photographs. I must also acknowledge the help received from Prof H Shirkey, Dr Roy Brown, Prof Ashfaq Ahmad and Dr VK Dogra.

Prof NS Tibrewala has been kind enough to write the *Foreword* in spite of his preoccupations, especially as President of the forthcoming *15th International Congress of Pediatrics.* He has indeed done me an honor.

Principal NS Pathania, Prof SS Manchanda, Prof PM Udani, Prof RS Dayal and Prof VB Raju figure among our eminent medical men who graciously blessed this project. I should record my appreciation of the fond interest evinced in this manual by Mr KA Padmanabhan, Mr Suraj Saraf and Dr K Chaudhry—all leading journalists.

Finally, I greatly value the favors extended by my folks through various stages of this publication. My kid sister, Veenu and brothers, Subhash and Raji helped me in many a way. They would cheer me up as and when I found the going tough.

To all of them, plus all those who contributed but are not identified here, I am highly grateful.

SURAJ GUPTE MD

"Gupte House"
60 Lower Gumat
Jammu

Acknowledgments

Special acknowledgements are made to

- Indian Academy of Pediatrics
- National Neonatology Forum
- World Health Organization (WHO)
- UNICEF
- American Academy of Pediatrics
- International Pediatric Association
- International Society of Tropical Pediatrics

for incorporating their recommendations in this volume, and

- Recent Advances in Pediatrics by Prof (Dr) Suraj Gupte
- Annales Nestle
- The Short Textbook of Medical Microbiology by Prof (Dr) Satish Gupte
- The Clinical Recognition of Congenital Heart Disease by Prof (Dr) JK Perloff
- Prof (Dr) K Indira Bai
- Maj (Dr) BK Sohi
- Prof (Dr) GP Mathur
- Dr Novy Gupte
- Cipla Ltd

for providing certain figures.

Every attempt has been made to acknowledge the sources of information at concerned points, in bibliography and/or here. Omission, if any, is unintentional and is regretted.

Contents

PART ONE: CORE PEDIATRICS

1. **Pediatric History-taking and Clinical Examination ... 3**
   Suraj Gupte, Rita Smith
   The Art of History Taking ... 3
   The Art of Physical Examination ... 6
   A Sample (Model) Pediatric Case Sheet ... 14
2. **Pediatrics in the Developing World ... 15**
   Suraj Gupte
   Contemporary Pediatrics ... 15
   Changing Pediatric Scenario ... 15
   Tropical Pediatrics ... 16
   Rights of the Child ... 17
   Contemporary Disease Pattern and Changing Concerns ... 18
   Mortality Scenario and Delivery of Child Health Care ... 20
   Pediatric Education ... 23
3. **Growth and Development ... 25**
   Suraj Gupte, EM Gomez
   Definitions ... 25
   Growth Studies ... 25
   Various Factors Influencing Growth and Development ... 25
   Various Periods of Growth ... 27
   Laws (Principles) of Growth ... 27
   Important Criteria/Indices for Assessment of Growth ... 28
   Linear Catchup Growth ... 36
   Growth (Reference) Standards ... 36
   Puberty (Adolescence) ... 37
   Development ... 37
   Normal Developmental Milestones ... 37
   Assessment of Development ... 37
   Approaches to Developmental Screening ... 39
4. **Growth Disorders ... 40**
   Suraj Gupte
   Failure to Thrive ... 40
   The Child with Short Stature ... 42
5. **Developmental Disorders ... 46**
   Suraj Gupte
   Developmental Delay ... 46
   Learning Disabilities (Dyslexia) ... 46
   Attention-deficit Hyperactivity Disorder (ADHD) ... 47
   Autistic Spectrum Disorders ... 48
   Enuresis (Bedwetting) ... 49
   Cerebral Palsy ... 51
   Behavioral Problems ... 51
6. **Child Psychiatry and Behavioral Problems ... 52**
   Suraj Gupte, Tejinder Singh
   Psychiatric Disorders: An Overview ... 52
   Behavioral Problems ... 53
   Pica (Geophagia) ... 54
   Anorexia Nervosa and Bulimia ... 55
   Enuresis ... 55
   Sleep Walking (Somnambulism) ... 55
   Breath-holding Spells ... 55
   Thumb-sucking and Nail Biting ... 56
   Teeth Grinding (Bruxism) ... 56
   Stuttering ... 56
   Tics (Habit Spasm) ... 56
   School Phobia ... 57
   Drug Abuse ... 57
   Periodic Syndrome ... 57
   Child Abuse and Neglect ... 58
   Principles of Counseling ... 58
7. **Adolescence ... 60**
   Suraj Gupte, AK Sahni
   Special Features of Three Stages of Adolescence ... 60
   Puberty Changes (Changes during Adolescence) . 60
   Factors Influencing Adolescent Health and Development ... 62
   Adolescent Psychology ... 63
   Adolescent Sexuality ... 63
   Adolescent Nutrition ... 64
   Special Health, Medical and Psychosocial Problems ... 64
   Promotion of Adolescent Health ... 69

8. Pediatric Biostatistics and Informatics 71
Mridula Chatterjee, Suraj Gupte
Biostatistics 71
Medical Informatics, Telemedicine, Cybermedicine and Internet 73
9. Community Pediatrics 78
Tejinder Singh, Suraj Gupte
Health 78
Community Pediatrics 78
Preventive Pediatrics 79
Social Pediatrics 79
Family Health 79
Under-Fives Clinics 80
Baby-Friendly Hospital Initiative (BFHI) 80
School Health Service 81
Juvenile Delinquency 82
Maternal and Child Health (MCH) 82
Integrated Child Development Services (ICDS) Scheme 84
Child Labor 86
Street Children 88
The Handicapped Child 89
The Girl Child 90
Prevention of Accidents 92
Child Abuse and Neglect 93
Integrated Management of Neonatal and Childhood Illness (IMNC) Strategy 93
India's National Health Programs 94
Acute Flaccid Paralysis (AFP) Surveillance 95
Television and the Child 95
Disposal of Hospital Waste 96
10. Immunization 97
Suraj Gupte
Basics of Immunization 97
Categories of Vaccines 97
Cold Chain 98
Some Additional Immunization-related Matters 98
• Vaccine Vial Monitoring 98
• Route of Administration 98
• Safe Injection Practices 98
Recommended Immunization Schedule 98
BCG Vaccination 98
Polio Vaccination 100
DPT Vaccination 102
Enhanced Inactivated Polio Vaccine (Salk Vaccine) 102
Typhoid Vaccination 103
Cholera Vaccination 103
Measles Vaccination 103
Mumps Vaccination 104
Rubella Vaccination 104
H. influenza Vaccination 105
Hepatitis B Vaccine 105
Hepatitis A Vaccine 106
Varicella Virus (Chickenpox) Vaccine 106
Combined Vaccines 106
Polyvalent Pneumococcal Vaccine 107
Influenza Vaccine 107
Meningococcal Vaccine 107
Japanese Encephalitis Vaccine 108
Vaccination against Rabies 108
11. Pediatric Nutritional Requirements 109
Suraj Gupte, Shashi Vani
Water 109
Energy 109
Proteins 110
Carbohydrates 110
Fats 111
Vitamins 111
Minerals and Trace Elements 111
Antioxidants 112
Indian Scenario 113
12. Infant Feeding 115
Suraj Gupte, EM Gomez
Anatomical Aspects of Lactation 115
Physiology of Lactation 115
Breastfeeding 116
Common Breastfeeding Problems 118
Lactation Failure 119
Complementary Feeding 120
Artificial (Formula) Feeding 122
Feeding the Low Birthweight (LBW) Infant 122
Non-nutritive Suckling 125
Common Feeding Problems 126
13. Protein-energy Malnutrition 129
Suraj Gupte, EM Gomez
Ecology of Malnutrition 129
Assessment of Nutritional Status 130
Protein-energy Malnutrition (PEM): A spectrum 133
Evolution of PEM 134
PEM and Disturbances of Metabolism 135
PEM and Infection 136
PEM and Family Planning 137
PEM and Endocrinal Status 137
PEM and Diarrhea 138
PEM and Cardiac Function 139
PEM and Renal Function 139
PEM and Drug Disposition 139
Classification of PEM 139
Special Features of Clinical Syndromes 140
Marasmic Kwashiorkor 145
Prekwashiorkor 145

Nutritional Dwarfism (Stunting) 145
Complications of PEM 146
Management of PEM 146
Phenomena Encountered during Nutritional Rehabilitation 149
Prognosis in PEM 150
Long-term Sequela of PEM 150
Prevention of Malnutrition 150
National Nutrition Programs 151
National Nutrition Policy 153
14. Vitamin Deficiencies 155
Suraj Gupte
Vitamin A Deficiency 155
Thiamine Deficiency 158
Riboflavin Deficiency 159
Nicotinic Acid Deficiency 160
Pyridoxine Deficiency 160
Vitamin B_{12} Deficiency 161
Folic Acid Deficiency 161
Vitamin C Deficiency 161
Vitamin D Deficiency 163
Refractive Rickets 166
Vitamin E Deficiency 167
Vitamin K Deficiency 168
15. Micronutrients/Minerals 170
Suraj Gupte
Iron Deficiency Disorders 170
Zinc Deficiency 170
Copper Deficiency 171
Cobalt and Selenium 171
Chromium, Manganese, Fluorine, Molybdenum, Nickel, Vanadium, Silicon and Arsenic 172
Iodine Deficiency (Endemic Goiter) 172
Calcium Deficiency 172
Magnesium Deficiency 173
Immunonutrition 173
Sodium and Potassium Deficiency 173
16. Fluids, Electrolytes and Acid-base Balance and its Disturbances 174
Lalita Bahl, Suraj Gupte
Physiologic Considerations 174
Disorders of Fluid and Electrolyte Balance 177
Disturbances of Acid-base Balance 179
Principles of Fluid and Electrolyte Therapy 181
Fluid Therapy in Special Situations 181

PART TWO: NEONATOLOGY

17. Neonatology 185
Shashi Vani, Javed Chowdhary, Suraj Gupte
Importance of the Neonatal Care 185
Nomenclature/Definitions Related to Perinatal/Neonatal Period 185
High-risk Pregnancy 186
Neonatal and Perinatal Mortality in India 186
Birth Trauma 188
Congenital and Other Defects 188
Neonatal Resuscitation 188
Apgar Score 195
The Fullterm Newborn 196
Primitive Neonatal Reflexes 199
Some Minor Problems of the Newborn 202
The Preterm Infant 204
Low Birth Weight (LBW) Infants 206
Stages of the Newborn Care 208
Basic Principles of Essential Newborn Care 209
The 3-Tier System of Neonatal Care 209
Determination of Gestational Age 209
Danger Signs 210
Neonatal Hypothermia 210
Kangaroo Mother Care (KMC) 211
Breastfeeding 212
Incubator Care 212
Open Care System 212
Hypoxic-ischemic Encephalopathy 213
Respiratory Distress Syndrome 215
Hyaline Membrane Disease (HMD) 215
Meconium Aspiration Syndrome (MAS) 217
Persistent Pulmonary Hypertension of the Newborn (PPHN) 218
Transient Tachypnea of the Newborn (TTN) 218
Neonatal Shock 218
Recurrent Neonatal Apnea (Apneic Spells) 219
Infections in the Newborn 220
Stridor 220
Congenital Syphilis 220
Congenital Toxoplasmosis 221
Congenital Rubella 221
Cytomegalovirus Disease 222
Herpes Simplex 222
Perinatal AIDS 223
Septic Umbilicus (Omphalitis) 223
Septicemia 223
Conjunctivitis 225
Pyoderma 226
Oral Thrush (Moniliasis, Candidiasis) 226
Noma Neonatorum 226
Neonatal Malaria 226
Tetanus Neonatorum 227
Hemorrhagic Disease of the Newborn 228
Neonatal Jaundice 228
Neonatal cholestasis Syndrome 235
Hemolytic Disease of the Newborn 236

Kernicterus 237
Neonatal Seizures 238
Neonatal Hypoglycemia 239
Neonatal Hypocalcemia (Neonatal Tetany) 240
Neonatal Hypomagnesemia 240
Infants of Diabetic Mothers (IDM) 240
Neonatal Hyperthermia 241
Neonatal Cold Injury 241
Sclerema 241
Neonatal Necrotizing Enterocolitis 242
Transport of Sick Neonates 242
Maternal Medication and Adverse Effects on the Fetus 243
Maternal Medication and Adverse Effects on the Breastfed infant 244
Food and Environmental Agents and Adverse Effects on the Infant 244

PART THREE: PEDIATRIC INFECTION

18. Pediatric Viral Infections 247
Ksh Chourjit, Suraj Gupte
Smallpox (Variola) 247
Monkeypox: A New Challenge 247
Chickenpox (Varicella) 248
Measles (Rubeola) 250
German Measles (Rubella, Three-day Measles) .. 253
Mumps (Epidemic Parotitis) 254
Poliomyelitis 255
Guillain-Barré Syndrome (GBS) 259
Acute Flaccid Paralysis (AFP) Surveillance 260
Infectious Mononucleosis 260
Dengue Fever 261
Chikungunya Fever 263
Japanese Encephalitis 263
Slow Virus Infection 264
Hydrophobia (Rabies) 264
Viral Hepatitis 264
Pediatric HIV/AIDS 265
Respiratory Syncytial Virus (RSV) Infection 268
Bird (Avian) Flu 269
Severe Acute Respiratory Syndrome (SARS) 269
19. Pediatric Bacterial Infections 270
Karnail Singh, Suraj Gupte
HIB Disease 270
Pertussis (Whooping Cough) 271
Diphtheria 273
Epidemic Typhus 275
Typhoid Fever (Enteric Fever) 276
Brucellosis 280
Tetanus 280
Leprosy (Hansen Disease) 282
Syphilis 284
Leptospirosis 286
Meningococcal Infections 286
Tuberculosis 286
Anaerobic Infections 288
Helicobacter pylori (H. pylori) Infection 288
Opportunistic Infections 290
Nosocomial Infections 291
Toxic Shock Syndrome 294
Noma 294
20. Pediatric Parasitosis 296
Suraj Gupte, Utpal Kant Singh
Malaria 296
Tropical Splenomegaly 301
Kala-azar (Black Sickness) 302
Filariasis 305
Tropical Eosinophilia 306
Common Parasitic Infestations of the Gut 307
Girdiasis 308
Amebiasis 309
Acanthamoeba 310
Cryptosporidiosis 311
Ascariasis 312
Oxyuriasis 313
Ancylostomiasis 313
Strongyloidiasis 314
Trichuriasis 314
Tapeworms 314
Neurocysticercosis 316
Hydatid Disease 317

PART FOUR: PEDIATRIC SUBSPECIALTIES

21. Pediatric Pulmonology 321
Daljit Singh, Suraj Gupte
Clinical Evaluation of a Respiratory Case 321
Special Diagnostic Procedures 321
Upper Respiratory Tract Infection 323
Foreign Body in Lower Respiratory Tract 323
Adult Respiratory Distress Syndrome 323
Acute Bronchitis 324
Respiratory Syncytial Virus (RSV) Infection 324
Acute Bronchiolitis 325
Severe Acute Respiratory Syndrome (SARS) 326
Pneumonias 327
Bronchiectasis 330
Dry Pleurisy 331
Pleural Effusion 331
Empyema Thoracic 333
Lung Abscess 334
Bronchial Asthma 334

Tuberculosis 339
Recurrent Respiratory Infection 350
The Child with Wheezy Chest 350
Cystic Fibrosis 350
Legionellosis 351
Drowning and Near Drowning 351
22. Pediatric Cardiology 353
PP Maiya, Karunakara BP, Suraj Gupte
Evaluation of a Cardiavascular Case 353
Fetal Circulation 356
Circulatory Changes at Birth….. 356
Congestive Cardiac Failure 357
Congenital Heart Disease 359
• Ventricular Septal Defect (VSD) 361
• Atrial Septal Defect (ASD) 363
• Patent Ductus Arteriosus (PDA) 365
• Tetralogy of Fallot (TOF) 366
• Fallot's Physiology 368
• Tricuspid Atresia 369
• Ebstein Anomaly 370
• Transposition of Great Arteries (TGA) 371
• Total Anomalous Pulmonary Venous Return .. 372
• Hypoplastic Left Heart Syndrome 373
• Aortic Stenosis 373
• Coarctation of Aorta Syndrome 374
Rheumatic Fever 376
Rheumatic Heart Disease 382
Infective Endocarditis 386
Tricuspid Regurgitation 386
Mitral Valve Prolapse Syndrome …. 389
Paroxysmal Atrial Tachycardia (PAT) 389
Sick Sinus Syndrome 390
Long QT Syndrome 390
Cardiomyopathy 391
Takayasu Arteritis 390
Pericarditis 391
Dextrocardia 393
Myocarditis 393
Systemic Hypertension 394
Interventional Cardiac Procedures 399
23. Pediatric Neurology 400
Suraj Gupte, Bhavana B Chowdhary
Developmental Aspects 400
Neurologic Evaluation 400
Neural Tube Defects 402
Pseudotumor Cerebri 404
Acute Stroke Syndrome 405
Bell Palsy 406
Guillain-Barre Syndrome 406
Mental Retardation 408
Down Syndrome 410
Cerebral Palsy 413
Autism 413
CNS Tuberculosis 417
Meningitis 416
Tuberculoma 420
Encephalitis 421
Hydrocephalus 423
Intracranial Space Occupying Lesions 425
Brain Abscess 425
Subdural Effusion 426
Subdural Hematoma 426
Neurocysticercosis 427
Intracranial Tumors 428
Cavernous Sinus Thrombosis 428
Craniosynostosis 428
Febrile Seizures 430
Convulsive Disorders 430
Chronic/Recurrent Convulsions 431
Status Epilepticus 432
Intractable Seizures 433
Phakomatosis (Neurocutaneous Syndromes) 434
Infantile Tremor Syndrome 434
Reye Syndrome 434
Spasmus Nutans 435
The Child with Ataxia 435
The Child with Coma 436
Degenerative Brain Disorders 438
Paraplegia 440
24. Pediatric Gastroenterology 443
Suraj Gupte, RA Anderson
Basics of Gastrointestinal Tract 443
Special Investigative Work-up… 443
Diarrheal Diseases: An Overview 444
Acute Diarrhea 444
Cholera 453
Acute Bacillary Dysentery 454
Pseudomembranous Colitis 455
Oral Rehydration Therapy (ORT) 456
Persistent Diarrhea 459
Chronic Diarrhea 462
Celiac Disease 465
Cystic Fibrosis 467
Endemic Tropical Sprue 469
Protein-losing Enteropathy 469
Carbohydrate Malabsorption 470
Cow Milk Allergy 470
Acrodermatitis Enteropathica 470
Inflammatory Bowel Disease 471
Constipation 472
Recurrent Aphthous Stomatitis 473
Thrush 474
Geographic Tongue 474
Stress (Secondary) Ulcer Disease 474

Gastroesophageal Reflux Disease (GERD) 475
Gastrointestinal Bleeding 476
Recurrent Abdominal Pain (RAP) 477
H. pylori Infections 478
Food Allergy 478
25. Pediatric Hepatology 481
Suraj Gupte, RA Anderson
Basics of Hepatobiliary System 481
Functions of Liver 481
Manifestations of Liver Disease 481
Diagnostic Work-up…. 481
Indian Childhood Cirrhosis 482
Reye Syndrome 484
Viral Hepatitis 487
Fulminant Hepatitis 490
Fulminant/Acute Hepatic Failure 490
Chronic Liver Disease 491
Chronic Hepatitis 492
Australia Antigen 494
Portal Hypertension 494
Neonatal Cholestatic Syndrome 496
Cholecystitis 498
Choledochal cyst 498
Drug-induced Liver Injury 499
Hepatomegaly 500
Liver Abscess 500
Wilson Disease 501
Approach to the Child with Ascites 501
Orthotopic Liver Transplantation 502
26. Pediatric Nephrology 504
Suraj Gupte, RM Shore
Basics of the Renal System 504
Diagnostic Work-up….. 504
Congenital Malformations of Kidney and Urinary Tract 505
Neurogenic Bladder 506
Obstructive Uropathy 506
Proteinuria 507
Hematuria 507
Urinary Tract Infection (UTI) 509
Acute Glomerulonephritis 510
Renal Tubular Diseases 511
Acute Renal Failure (ARF) 513
Chronic Renal Failure (CRF) 513
Hemolytic-Uremic Syndrome (HUS) 516
Nephrotic Syndrome 517
Hypertension 521
End-stage Renal Disease (ESRD) 522
Renal Osteodystrophy 522
27. Pediatric Hematology 524
Jagdish Chandra, Suraj Gupte, Praveen C Sobti
Developmental Aspects….. 524
Anemias 524
Nutritional Anemia 525
Physiologic Anemia of Prematurity 528
Anemia of PEM 528
Hypochromic Anemias Refractory to Iron 529
Megaloblastic Anemia 530
Hemolytic Anemias 530
Characteristics of Hemolysis 531
Hereditary Spherocytosis 532
Thalassemia 532
Sickle-cell Anemia 535
G-6-PD Deficiency 536
Pyruvate Kinase Deficiency 536
Autoimmune Hemolytic Anemia 537
Methemoglobinemia 537
Aplastic Anemia 537
Mechanism of Coagulation (Hemostasis) 538
Approach to a Child with Bleeding 539
Disseminated Intravascular Coagulation (DIC) .. 540
Hemorrhagic Disease of the Newborn 542
Hemophilia 544
Von Willebrand Disease 546
Immune Thrombocytopenic Purpura (ITP) 546
Wiskott-Aldrich Syndrome 548
Drug-induced Thrombocytopenia 549
Anaphylactoid (Henoch-Schöenlein) Purpura .. 549
Purpura Fulminans 550
Leukocyte Dysfunction 550
Neutropenia 550
Venous Thromboembolism 551
Polycythemia (Erythrocytosis) 552
Hemopoietic Sten Cell Transplantation 552
Blood Component Therapy 553
28. Pediatric Oncology 555
Suraj Gupte, AM Graham
Leukemia 555
Lymphomas 559
Hodgkin's Disease 559
Non-Hodgkin Lymphoma 561
Wilms' Tumor (Nephroblastoma) 562
Neuroblastoma 563
Hepatoblastoma 564
Brain Tumors 565
Bone Tumors 566
Soft Tissue Sarcomas 567
Retinoblastoma 567
Thymoma 568
Teratomas 568
Oncologic Emergencies 568
Bone Marrow Transplantation 569
29. Pediatric Immunology 571
ML Kulkarni, Suraj Gupte, S Frank
Immunologic System: Fundamentals 571

Immunodeficiency States 574
• Primary 575
• Secondary 578
Diagnostic Approach in Immunodeficiency 578
Immunologic Basis of Autoimmune Disease 580
Immunologic Basis of Allergy (Atopy) 580
Immunologic Aspects of Malignancy 581
Immunodeficiency and Special Risks 581
Intravenous Immunoglobulins (IVIG) 581
Bone Marrow Transplantation 583
30. Pediatric Collagenosis 584
Suraj Gupte, DM Sharma
Rheumatic Fever 584
Juvenile Rheumatoid Arthritis 584
Systemic Lupus Erythematosus 586
Dermatomyositis 587
Polyarteritis Nodosa 587
Scleroderma 588
Mixed Connective Tissue Disease 588
Goodpasture Syndrome 588
Fascitis 588
Benign Rheumatoid Nodules 588
Vasculitis Syndromes 588
Kawasaki Disease 588
Behcet's Disease 590
Wegener's Granulomatosis 590
31. Pediatric Dermatology 591
Suraj Gupte, NE Parsons
Atopic Dermatitis 591
Insect Bite Hypersensitivity 592
Drug Eruption 592
Scabies 593
Pediculosis 593
Ringworm Infections 594
Moniliasis (Candidiasis) 594
Diaper Rash 595
Prickly Heat 595
Seborrhea 595
Urticaria (Nettle Rash) 596
Pyodermas 596
Erysipelas 597
Scalded Skin Syndrome (SSS) 597
Ichthyosis 598
Café-au-lait Spots 599
Albinism 600
Vitiligo 600
Leprosy 600
Hemangioma 600
Telangiectatic Angioma 601
Epidermolysis Bullosa 601
Erythema Multiforme 602
Pemphigus 603
Ehler-Danlos Syndrome 603
Molluscum Contagiosum 604
Warts 604
Erythema Nodosum 604
Skin Tuberculosis 604
Ectodermal Dysplasias 604
Acne 605
Psoriasis 606
32. Pediatric Accidental Poisoning 608
Suraj Gupte, RK Kaushal
Accidental Poisoning: An Overview 608
Kerosene Oil Poisoning 612
Organic Phosphate Poisoning 612
DDT Poisoning 613
Paracetamol Toxicity 613
Barbiturate Poisoning 613
Ibuprofen Toxicity 614
Aspirin Poisoning 614
Phenothiazine Toxicity 614
Chloroquine-induced Psychosis 615
Cyproheptadine Poisoning 615
Iron (Iron Salts) Poisoning 615
Morphine and Other Opiates Poisoning 616
Datura (Atropine) Poisoning 616
Lead Poisoning (Plumbism) 616
Mercury Poisoning 617
Lathyrism 617
33. Pediatric Envenomations 619
Suraj Gupte, RK Kaushal
Snake Bite 619
Scorpion Sting 621
34. Pediatric Endocrinology 623
Suraj Gupte, AW Koff
The Endocrine Orchestra 623
Hypothalamus and its Disorders 623
Pituitary and its Disorders 624
Short Stature 624
Growth Hormone Deficiency (GHD) 624
Thyroid and its Disorders 625
Congenital Hypothyroidism (Cretinism) 625
Acquired Hypothyroidism 629
Hyperthyroidism 629
Goiter (Thyromegaly) 629
Parathyroid and Disorders 629
Adrenal and its Disorders 630
Gonads and their Deficiency 631
Undescended Testes (Cryptorchidism) 631
Precocious Puberty 631
Delayed Puberty 632
The Child with Ambiguous Genitalia 633
Diabetes Mellitus 634
The Obese Child 638

35. Genetics in Pediatric Practice 642
Suraj Gupte, S Frank
Genetics in Human Wellbeing 642
Human Cell Division 642
The Genes 643
Types of Inheritance 643
Variations in Expression of Genetic Traits 644
Types of Genetic Disorders 644
Human Genome Project 644
The Chromosomes 644
Chromosomal Disorders 645
Inborn Errors of Metabolism 647
Phenylketonuria 647
Albinism 648
Alkaptonuria 648
Homocystinuria 648
Maple Syrup Urine Disease 648
Hartnup Disease 648
Tyrosinemia 649
Galactosemia 649
Glycogen Storage Disease (GSD) 649
Gaucher Disease 650
Niemann-Pick Disease 650
Mucopolysaccharidosis (MPS) 650
Prenatal Diagnosis 653
Dermatoglyphics 654
Gene Therapy 655
Genetic Counseling 655
36. Pediatric Neuromuscular Disorders 657
Vishnu Bhat B, Suraj Gupte
Neuromuscular Transmission Disorders 657
Motor Neuron Disorders 657
Spinal Muscular Atrophies 658
Developmental (Congenital) Disorders of Muscles 658
Benign Congenital Hypotonia 658
Muscular Dystrophies 659
Pseudohypertrophic Muscular Dystrophy 659
Endocrinal Myopathies 662
Metabolic Myopathies 662

PART FIVE: PEDIATRIC SUPERSPECIALTIES

37. Pediatric Ophthalmology 667
Vijay Wali, Suraj Gupte
Developmental Aspects 667
Orbital Diseases 667
Diseases of the Eyelids 669
Diseases of the Lacrimal System 671
Conjunctival Diseases 671
Corneal Diseases 672
Pupillary and Iris Abnormalities 673
Diseases of Lens 673
Disease of the Uveal Tract 674
Eye Movement and Alignment Diseases 674
Refractory Errors 675
Visual Disorders 675
Diseases of the Retina and Vitreous 676
Retinoblastoma 676
Optic Nerve Diseases 677
Systemic Medication and Ocular Damage 679
Ocular Trauma 679
38. Pediatric Ear, Nose and Throat (ENT) Problems 680
Aniece Chowdhary, Suraj Gupte
The Ear Disorders 680
The Nose Disorders 683
The Throat Disorders 685
Intubation and Tracheostomy 687
39. Pediatric Dental Problems 689
NK Nagpal, Suraj Gupte
Normal Dentition 689
Dental Malocclusion 689
Dental Caries 690
Guidelines for Prevention of Dental Disease 691
Cleft Lip and Palate 692
40. Pediatric Surgery 694
Devendra Gupta, Suraj Gupte
Gastrointestinal Problems 694
• Congenital Hypertrophic Pyloric Stenosis 694
• Hiatal Hernia (Partial Thoracic Stomach) 695
• Esophageal Atresia and Tracheoesophageal Fistula 695
• Congenital Diaphragmatic Hernia (CDH) 696
• Duodenal and Other Intestinal Atresias 697
• Intestinal Malrotation 697
• Intussusception 698
• Hirschsprung's Disease 699
• Meconium Plug Syndrome 699
• Meconium Ileus 699
• Meckel's Diverticulum 700
• Necrotizing Enterocolitis 700
• Appendicitis 700
Anorectal Problems 700
• Imperforate Anus and Other Malformations . 700
• Anal Fissure (Fissure-in-ano) 701
• Perianal Abscess and Fistula 701
• Pilonoidal Sinus and Abscess 701
Anomalies Related to the Umbilicus 701
• Vitellointestinal Fistula 701
• Umbilical Polyp 701
• Umbilical Hernia 701
• Exomphalos (Omphalocele) and Gastroschisis 701

Anomalies of the Hepatobiliary System 702
• Extrahepatic Biliary Atresia (EHBA) 702
• Choledochal Cysts 703
• Cholecystitis (Calculus Type) 704
Genitourinary Problems 704
• Obstructive Uropathy 704
• Renal Stone 704
• Primary Bladder Stone Disease 705
• Priapism 705
• Tight External Urethral Meatus (Meatal Stenosis) 706
• Phimosis and Paraphimosis 706
• Hypospadias and Epispadias 706
• Ambiguous Genitalia 706
Inguinoscrotal Problems 706
• Inguinal Hernia 706
• Hydrocele 706
• Undescended Testes (Cryptorchidism) 707
• Epididymo-orchitis 707
• Acute Scrotum 707
Head and Neck Problems 707
• Cleft Lip and Cleft Palate 707
• Cystic Hygroma (Lymphangioma) 707
• Thyroglossal Cyst 708
• Brachial Cyst 708
• Brachial Sinus and Fistula 708
• Sternomastoid Tumor (Sternocleidomastoid Tumor) 708
Miscellaneous Problems 708
• Abscess 708
41. Pediatric Orthopedics 709
Surya Bhan, Suraj Gupte
Congenital Deficiency of Long Bones 709
Club Foot 709
Flat Foot 709
Radial Club Hand 709
Trigger Thumb 710
Polydactyly 710
Syndactyly 710
Congenital Constriction Bands/Rings 710
Congenital Pseudoarthrosis of the Tibia 710
Dislocation of Patella 710
Knock Knee 710
Bow Leg 710
Cleidocranial Dysostosis 710
Hemihypertrophy 711
Slipped Capital Femoral Epiphysis 711
Developmental Dysplasia of the Hip 711
Scoliosis 712
Kyphosis 712
Genetic Skeletal Dysplasias 712
• Osteogenesis Imperfecta 712
• Marfan Syndrome 713
• Arthrogryposis Multiplex Congenita 714
• Achondroplasia 714
• Pseudoachondroplasia 715
• Osteopetrosis 715
• Osteochondritis 715
• Limb Length Discrepancy 715
Infections/Inflammations of Bones and Joints .. 716
• Acute Septic (Pyogenic) Arthritis 716
• Osteomyelitis 716
• Tuberculosis of Bones and Joints 717
• Transient Synovitis of the Hip 718
• Rheumatoid Arthritis 718
• Bone Tumors 718
Pediatric Sports Medicine 718
Pediatric Fractures 719

PART SIX: MISCELLANEOUS AND UNCLASSIFIED ISSUES

42. Miscellaneous and Unclassified Issues 723
Suraj Gupte
Child Adoption 723
Child Abuse and Neglect 724
Infantile Tremor Syndrome 726
Sudden Infant Death Syndrome (SIDS) 728
Progeria 729
Chronic Fatigue Syndrome 730
Growing Pains 730
Histiocytosis 730
Sarcoidosis 731
Some Minor Problems of the Newborn, the Infant and the Young Child 731
Modern Imaging Techniques 733
Computers: Applications in Pediatrics 735
Heat Injury 736
Emerging and Re-emerging Infections 737
Evidence-based Medicine (EBM) 737

PART SEVEN: PEDIATRIC PROCEDURES

43. Pediatric Practical Procedures 743
Vasudev Vatwani, Suraj Gupte
General Rules/Precautions 743
Restraint and Positioning 743
Intramuscular Injection 743
Subcutaneous Injection 744
Intradermal Injection 744
Venipuncture 744
Intravenous Infusion 745
Arterial Puncture 747

Intraosseous Infusion 747
Subcutaneous Infusion 748
Intraperitoneal Infusion 748
Rectal Infusion 748
Bone Marrow Aspiration 748
Bone Marrow Trephine 749
Lumbar Puncture 749
Subdural Puncture or Tap 749
Ventricular Tap 750
Thoracentesis 750
Pericardial Puncture 750
Abdominal Paracentesis 750
Suprapubic Bladder Aspiration 751
Heel Puncture 751
Liver Biopsy 751
Kidney Biopsy 751
Intubation 752
Lymph Node Biopsy 752
Fine Needle Aspiration 752
Gastric Lavage 753
Manual Removal of Foreign Body from Airway 753
Cardiac Resuscitation 754
Assisted Ventilation 754

44. Pediatric Laboratory Procedures 756
Suraj Gupte, Bhavna B Chowdhary
Blood Examination 756
Urine Examination 758
Stool Examination 760
CSF Examination 762

PART EIGHT: PEDIATRIC SYNDROMES

45. Pediatric Syndromes 767
Suraj Gupte

PART NINE: PEDIATRIC DRUG DOSAGES

46. Pediatric Drug Dosages 775
Lalita Bahl, Suraj Gupte

***Appendices* 785**
A Useful Normal Laboratory Values 785
B Important Conversions 785
C International Days 788
D World Health Day (April 7) Themes 788
E World Breastfeeding Week (August 1 To 6) Themes 788
F The IMNCI Case Management Process 789
G IMNCI Case Management in the Outpatient Health Facility, First-level Referral Facility and at Home for the Sick Young Infant up to 2 Months Age 790
H IMNCI Case Management in the Outpatient Health Facility, First-level Referral Facility and at Home for the Sick Child From Age 2 Months up to 5 Years 791
I Syllabus Module of Didactic Teaching for Undergraduates As Per Recommendation of the Medical Council of India (MCI) 792
J Final MBBS Part II (Pediatric) Examination 793
K Important Websites on Pediatrics and Allied Fields 793
L New (2006) WHO Child Growth Standards 795

***Index* 807**

THE SHORT TEXTBOOK OF PEDIATRICS