英文原版

## 现代儿科疾病诊断与治疗

# CURRENT PEDIATRIC Diagnosis & Treatment

William W. Hay, Jr.
Anthony R. Hayward
Myron J. Levin
Judith M. Sondheimer



fifteenth edition

## CURENT

## Pediatric Diagnosis & Treatment

### 15th Edition

### Edited by

### William W. Hay, Jr., MD

Professor, Department of Pediatrics
Director, Training Program in Neonatal-Perinatal Medicine
Director, Neonatal Clinical Research Center
Section of Neonatology and the Division of Perinatal Medicine and Research
University of Colorado School of Medicine and The Children's Hospital, Denver

### Anthony R. Hayward, MD, PhD

Professor, Departments of Pediatrics and Immunology University of Colorado School of Medicine and The Children's Hospital, Denver

### Myron J. Levin, MD

Professor, Departments of Pediatrics and Medicine
Head, Section of Pediatric Infectious Diseases
University of Colorado School of Medicine and The Children's Hospital, Denver

### Judith M. Sondheimer, MD

Professor, Department of Pediatrics Head, Section of Pediatric Gastroenterology, Hepatology, and Nutrition University of Colorado School of Medicine and The Children's Hospital, Denver

### and Associate Authors

The Department of Pediatrics at the University of Colorado School of Medicine is affiliated with The Children's Hospital of Denver, Colorado.

人民卫生出版社 McGraw-Hill

### 人民卫生出版社

### McGraw-Hill



A Division of The McGraw-Hill Companies

### Current Pediatric Diagnosis & Treatment, Fifteenth Edition

Copyright © 2001 by the McGraw-Hill Companies, Inc. All rights reserved. Printed in the United States of America. Except as permitted under the United States Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a data base or retrieval system, without the prior written permission of the publisher.

Previous edition copyright © 1999, 1997, 1995, 1991, 1987 by Appleton & Lange

### **Notice**

Medicine is an ever-changing science. As new research and clinical experience broaden our knowledge, changes in treatment and drug therapy are required. The authors and the publisher of this work have checked with sources believed to be reliable in their efforts to provide information that is complete and generally in accord with the standards accepted at the time of publication. However, in view of the possibility of human error or changes in medical sciences, neither the authors nor the publisher nor any other party who has been involved in the preparation or publication of this work warrants that the information contained herein is in every respect accurate or complete, and they disclaim all responsibility for any errors or omissions or for the results obtained from use of the information contained in this work. Readers are encouraged to confirm the information contained herein with other sources. For example and in particular, readers are advised to check product information sheet included in the package of each drug they plan to administer to be certain that the information contained in this work is accurate and that changes have not been made in the recommended dose or in the contraindications for administration. This recommendation is of particular importance in connection with new or infrequently used drugs.

图字: 01~2000~4161

### 现代儿科疾病诊断与治疗(英文版)

主 编:(美)William W. Hay, Jr. 等

**出版发行:** 人民卫生出版社(中继线 67616688)

地: (100078)北京市丰台区方庄芳群园 3 区 3 号楼

**斌:** http://www.pmph.com

E - mail: pmph @ pmph. com

印 刷:北京人卫印刷厂

经 销:新华书店

开 本: 787×1092 1/16 印张: 79.5

字 数: 3324 千字

版 次: 2001年2月第15版第1次印刷

标准书号: ISBN 7-117-04183-8/R·4184

定 价: 162.00 元

著作权所有,请勿擅自用本书制作各类出版物,违者必究

(凡属质量问题请与本社发行部联系退换)

### Authors

### Frank J. Accurso, MD

Professor, Department of Pediatrics, Section of Pediatric Pulmonary Medicine, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: accurso.frank@tchden.org
Respiratory Tract & Mediastinum

### Edythe A. Albano, MD

Assistant Professor, Department of Pediatrics, Section of Pediatric Hematology, Oncology, and Bone Marrow Transplantation, University of Colorado School of Medicine and The Children's Hospital, Denver Internet: albano.edythe@tchden.org

Neoplastic Disease

### Daniel R. Ambruso, MD

Professor, Department of Pediatrics, Section of Pediatric Hematology, Oncology, and Bone Marrow Transplantation, University of Colorado School of Medicine and The Children's Hospital; Associate Medical Director, Bonfils Blood Center, Denver Internet: daniel.ambruso@uchsc.edu

Hematologic Disorders

### Marsha S. Anderson, MD

Assistant Professor, Department of Pediatrics, Section of Pediatric Infectious Diseases, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: anderson.marsha@tchden.org
Infections: Bacterial & Spirochetal

### F. Keith Battan, MD

Associate Professor, Department of Pediatrics, Section of Emergency Medicine, University of Colorado School of Medicine; Associate Director, Emergency and Trauma Services, The Children's Hospital, Denver

Internet: battan.keith@tchden.org
Emergencies, Injuries, & Poisoning

### Donald W. Bechtold, MD

Associate Professor, Department of Psychiatry; Director of Training in Child and Adolescent Psychiatry and Clinical Director, Division of Child and Adolescent Psychiatry; University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: donald.bechtold@uchsc.edu

Psychosocial Aspects of Pediatrics & Child & Adolescent Psychiatric Disorders

### Stephen Berman, MD

Professor, Department of Pediatrics, and Head, Section of General Academic Pediatrics, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: berman.stephen @tchden.org

Ear, Nose, & Throat

### Mark Boguniewicz, MD

Associate Professor, Department of Pediatrics, University of Colorado School of Medicine and National Jewish Medical and Research Center, Denver

Allergic Disorders

### Mark M. Boucek, MD

Professor, Department of Pediatrics, and Head, Section of Pediatric Cardiology, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: boucek.mark@tchden.org

Cardiovascular Diseases

### Robert M. Brayden, MD

Associate Professor, Department of Pediatrics, Section of General Academic Pediatrics, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: brayden.robert@tchden.org

Office Pediatrics

### Todd C. Carpenter, MD

Assistant Professor, Department of Pediatrics, Section of Pediatric Critical Care Medicine, University of Colorado School of Medicine and The Children's Hospital, Denver

Interent: todd.carpenter@uchsc.edu

Critical Care

### Kenny H. Chan, MD

Associate Professor, Department of Otolaryngology, University of Colorado School of Medicine; Chairman, Department of Pediatric Otolaryngology, The Children's Hospital, Denver Internet: chan.kenny@tchden.org

Ear, Nose, & Throat

### H. Peter Chase, MD

Professor of Pediatrics, University of Colorado School of Medicine and The Children's Hospital, Denver; Clinical Director, Barbara Davis Center for Childhood Diabetes, Denver

Internet: peter.chase@uchsc.edu

Diabetes Mellitus

### Richard C. Dart, MD, PhD

Associate Professor, Departments of Surgery, Medicine, and Pharmacy, University of Colorado School of Medicine, Denver; Director, Rocky Mountain Poison and Drug Center, Denver Health Authority, Denver

Internet: rdart@rmpdc.org

Emergencies, Injuries & Poisoning

### Roberta L. DeBiasi, MD

Assistant Professor, Department of Pediatrics, Sections of Pediatric Infectious Diseases, and Neurology, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: roberta.debiasi@uchsc.edu

**Immunization** 

### Robin R. Deterding, MD

Associate Professor, Department of Pediatrics, Sections of Pediatric Pulmonary Medicine, Univeristy of Colorado School of Medicine and The Children's Hospital, Denver

Internet: deterding.robin@tchden.org
Respiratory Tract & Mediastinum

### Emily L. Dobyns, MD

Associate Professor, Department of Pediatrics, Section of Pediatric Critical Care Medicine, University of Colorado School of Medicine and The Children's Hospital, Denver Internet: dobyns.emily@tchden.org

Critical Care

### Anthony G. Durmowicz, MD

Associate Professor, Department of Pediatrics, Division of Pediatric Pulmonology, University of Utah School of Medicine; Primary Children's Medical Center, Salt Lake City

Internet: anthony.durmowicz@hsc.utah.edu

Critical Care

### Robert E. Eilert, MD

Professor, Department of Pediatrics, University of Colorado School of Medicine; Rose Brown Professor, Department of Orthopedic Surgery, University of Colorado School of Medicine; Chairman, Department of Orthopedic Surgery, The Children's Hospital, Denver

Internet: eilert.robert@tchden.org

**Orthopedics** 

### George S. Eisenbarth, MD, PhD

Professor, Departments of Pediatrics, Medicine, and Immunology, University of Colorado School of Medicine and The Children's Hospital, Denver; Executive Director, Barbara Davis Center for Childhood Diabetes, Denver

Internet: george.eisenbarth@uchsc.edu

Diabetes Mellitus

### Allan M. Eisenbaum, MD

Associate Clinical Professor, Department of Ophthalmology, University of Colorado School of Medicine, Denver

Internet: aeisenoptc@aol.com

Eye

### Margaret A. Ferguson, MD

Assistant Professor, Department of Pediatrics, Section of Pediatric Critical Care Medicine, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: ferguson.margaret@tchden.org

Critical Care

### Douglas M. Ford, MD

Associate Professor, Department of Pediatrics, Section of Pediatric Renal Medicine, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: ford.douglas@tchden.org

Fluid, Electrolyte, & Acid-Base Disorders & Therapy

### Nicholas K. Foreman, MD

Associate Professor, Department of Pediatrics, Section of Pediatric Hematology, Oncology, and Bone Marrow Transplantation, University of Colorado School of Medicine; Director, Neuro-Oncology, The Children's Hospital, Denver Internet: foreman.nicholas@tchden.org

Neoplastic Disease

### Roger H. Giller, MD

Associate Professor of Pediatrics, University of Colorado School of Medicine; Director, Pediatric Bone Marrow Transplant Service, The Children's Hospital, Denver

Internet: giller.roger@tchden.org

Neoplastic Disease: Hematopoietic Stem Cell Transplantation

### Edward Goldson, MD

Professor, Department of Pediatrics, Section of Developmental and Behavioral Pediatrics, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: goldson.edward@tchden.org
Child Development & Behavior

### Stephen I. Goodman, MD

Professor, Department of Pediatrics, and Head, Section of Genetics, Metabolism, and Birth Defects, University of Colorado School of Medicine and The Children's Hospital, Denver Internet: stephen.goodman@uchsc.edu Inborn Errors of Metabolism

### Douglas K. Graham, MD, PhD

Pediatric Fellow, Department of Pediatrics, Section of Hematology, Oncology and Bone Marrow Transplant, University of Colorado Health Sciences Center and The Children's Hospital, Denver

Internet: graham.douglas@tchden.org
Neoplastic Disease

### Carol L. Greene, MD

Associate Professor, Department of Pediatrics, Section of Genetics, Metabolism, and Birth Defects, University of Colorado School of Medicine and The Children's Hospital, Denver Inborn Errors of Metabolism

### Brian S. Greffe, MD, CM

Associate Professor, Department of Pediatrics, Section of Pediatric Hematology, Oncology, and Bone Marrow Transplantation, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: greffe.brian@tchden.org
Neoplastic Disease

### Randi J. Hagerman, MD

Professor, Department of Pediatrics, and Head, Section of Developmental and Behavioral Medicine, University of Colorado School of Medicine and The Children's Hospital, Denver Child Development & Behavior

### Ann C. Halbower, MD

Assistant Professor, Department of Pediatrics, Section of Pediatric Pulmonary Medicine, University of Colorado School of Medicine; Director, Rocky Mountain Pediatric Sleep Disorders Program, The Children's Hospital, Denver Internet: halbower.ann@tchden.org

Respiratory Tract & Mediastinum

### K. Michael Hambidge, MD, BChir, ScD, FRCP (Edin.)

Professor Emeritus, Department of Pediatrics, University of Colorado Center for Human Nutrition, University of Colorado School of Medicine and The Children's Hospital, Denver Internet: michael.hambidge@uchsc.edu

Normal Childhood Nutrition & Its Disorders

### Keith B. Hammond, MS, FIMLS

Senior Instructor, Departments of Pediatrics and Pathology, and Director, Pediatric Clinical Research Center Laboratory, University of Colorado School of Medicine and The Children's Hospital, Denver Internet: keith.hammond@uchsc.edu

Normal Biochemical & Hematologic Values

### Anthony R. Hayward, MD, PhD

Professor, Department of Pediatrics and Immunology, University of Colorado School of Medicine and The Children's Hospital, Denver Internet: anthony.hayward@uchsc.edu

Immunodeficiency

### J. Roger Hollister, MD

Professor, Department of Pediatrics, and Head, Section of Pediatric Rheumatology, University of Colorado School of Medicine and The Children's Hospital, Denver Rheumatic Diseases

### D. Dunbar Ivy, MD

Assistant Professor, Department of Pediatrics, Section of Pediatric Cardiology, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: dunbar.ivy@uchsc.edu
Cardiovascular Diseases

### Candice E. Johnson, MD, PhD

Professor, Department of Pediatrics, Section of General Academic Pediatrics, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: johnson.candice@tchden.org
Ear, Nose, & Throat

### Michael B. Jordan, MD

Fellow, Pediatric Hematology/Oncology, University of Colorado Health Sciences Center Internet: jordanm@njc.org
Neoplastic Disease

### David W. Kaplan, MD, MPH

Professor, Department of Pediatrics, and Head, Section of Adolescent Medicine, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: kaplan.david@tchden.org
Adolescence

### Michael S. Kappy, MD, PhD

Professor, Department of Pediatrics, and Head, Section of Pediatric Endocrinology, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: kappy.michael@tchden.org

Endocrine Disorders

### Peggy E. Kelley, MD

Assistant Professor of Otolaryngology, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: kelley.peggy@tchden.org

Ear, Nose, & Throat

### Gwendolyn S. Kerby, MD

Instructor, Department of Pediatrics, Section of Pediatrics Pulmonary Medicine, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: kerby.gwendolyn@tchden.org Respiratory Tract & Mediastinum

### Nancy F. Krebs, MD, MS

Associate Professor, Department of Pediatrics, and Head, Section of Nutrition, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: nancy.krebs@uchsc.edu

Normal Childhood Nutrition & Its Disorders

### Richard D. Krugman, MD

Professor, Department of Pediatrics, and Dean, University of Colorado School of Medicine, Denver

Internet: richard.krugman@uchsc.edu

Child Abuse & Neglect

### Peter A. Lane, MD

Associate Professor, Department of Pediatrics, Section of Pediatric Hematology, Oncology, and Bone Marrow Transplantation, and Director, Colorado Sickle Cell Treatment and Research Center, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: peter.lane@uchsc.edu

Hematologic Disorders

### Gary L. Larsen, MD

Professor, Department of Pediatrics, and Head, Section of Pediatric Pulmonary Medicine, University of Colorado School of Medicine; Senior Faculty Member, National Jewish Medical and Research Center, Denver

Internet: larseng@njc.org

Respiratory Tract & Mediastinum

### Donald Y. M. Leung, MD. PhD

Professor, Department of Pediatrics, University of Colorado School of Medicine; Head, Division of Pediatric Allergy-Immunology, National Jewish Medical and Research Center, Denver

Internet: leungd@njc.org Allergic Disorders

### Myron J. Levin, MD

Professor, Departments of Pediatrics and Medicine, and Head, Section of Pediatric Infectious Diseases, University of Colorado School of Medicine and The Children's Hospital, Denver Internet: myron.levin@uchsc.edu Infections: Viral & Rickettsial; Infections: Para-

### Angela Lorts, MD

Housestaff, Department of Pediatrics Residency Training Program, University of Colorado School of Medicine and The Children's Hospital, Denver Cardiovascular Diseases

sitic & Mycotic; Sexually Transmitted Infections

### Kathryn A. Love, MD

Assistant Professor, Department of Pediatrics, Section of Adolescent Medicine, University of Colorado School of Medicine and Denver Health Internet: kalove@dhha.org

Adolescence

### Gary M. Lum, MD

Professor, Departments of Pediatrics and Medicine, and Head, Section of Pediatric Nephrology. University of Colorado School of Medicine and The Children's Hospital, Denver Internet: lum.gary@tchden.org Kidney & Urinary Tract

### David K. Manchester, MD

Associate Professor, Departments of Pediatrics and Pharmacology, Section of Genetics, Metabolism, and Birth Defects, University of Colorado School of Medicine; Co-Director, Division of Genetic Services, The Children's Hospital, Denver Internet: manchester.david@tchden.org Genetics & Dysmorphology

### Dennis J. Matthews, MD

Associate Professor and Chairman, Department of Rehabilitation, University of Colorado School of Medicine; Chairman and Medical Director, The Children's Hospital Rehabilitation Center, Denver Internet: matthews.dennis@tchden.org Rehabilitation & Sports Medicine

### Elizabeth J. McFarland, MD

Assistant Professor, Department of Pediatrics, Section of Pediatric Infectious Diseases, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: betsy.mcfarland@uchsc.edu

Human Immunodeficiency Virus (HIV) Infection

### Susan Miller, PharmD

Adjunct Assistant Professor, School of Pharmacy, University of Colorado School of Medicine, Denver

Internet: miller.susan@tchden.org

Drug Therapy

### Paul G. Moe, MD

Professor, Departments of Pediatrics and Neurology, University of Colorado School of Medicine and The Children's Hospital, Denver Internet: moe.paul@tchden.org

Neurologic & Muscular Disorders

### Joseph G. Morelli, MD

Associate Professor, Departments of Dermatology and Pediatrics, University of Colorado School of Medicine and The Children's Hospital, Denver Internet: joseph.morellil@exchange.uchsc.edu Skin

### William A. Mueller, DMD

Chairman, Department of Pediatric Dentistry, The Children's Hospital; Clinical Associate Professor, University of Colorado School of Dentistry, Denver Internet: mueller.william@tchden.org

Oral Medicine & Dentistry

### Michael R. Narkewicz, MD

Associate Professor, Department of Pediatrics, Section of Pediatric Gastroenterology, Hepatology, and Nutrition, and The Pediatric Liver Center, University of Colorado School of Medicine and The Children's Hospital, Denver Internet: narkewicz.michael@tchden.org

Liver & Pancreas

### Rachelle Nuss, MD

Associate Professor, Department of Pediatrics, Section of Pediatric Hematology, Oncology, and Bone Marrow Transplantation, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: rachelle.nuss@uchsc.edu
Hematologic Disorders

### Ann-Christine Nyquist, MD, MSPH

Assistant Professor, Department of Pediatrics, Section of Pediatric Infectious Diseases and Epidemiology, University of Colorado School of Medicine; Director, Infection Control, The Children's Hospital, Denver

Internet: nyquist.ann-christine@tchden.org
Sexually Transmitted Infections

### Lorrie F. Odom, MD

Professor, Department of Pediatrics, Section of Pediatric Hematology, Oncology, and Bone Marrow Transplantation, University of Colorado School of Medicine; Director, Clinical Oncology, The Children's Hospital, Denver Internet: odom.lorrie@tchden.org

Neoplastic Disease

### John W. Ogle, MD

Professor and Vice Chairman, Department of Pediatrics, University of Colorado School of Medicine, Denver; Director, Department of Pediatrics, Denver Health

Internet: jogle@dhha.org

Antimicrobial Therapy; Infections: Bacterial & Spirochetal

### Patricia Orma, PharmD

Adjoint Professor, School of Pharmacy, University of Colorado Health Sciences Center; Clinical Coordinator, The Children's Hospital, Denver Internet: orma.patricia@tchden.org

Drug Therapy

### Donna B. Ornitz, MD

Clinical Instructor, Department of Ophthalmology, University of Colorado Health Sciences Center, Denver

Internet: pedeyedocs@aol.com Eye

### Ralph R. Quinones, MD

Associate Professor of Pediatrics; Director, Scientific Development, Blood and Marrow Processing Laboratory, Bone Marrow Transplant Program, University of Colorado School of Medicine and The Children's Hospital, Denver Internet: quinones.ralph@tchden.org

Neoplastic Disease

### Adam A. Rosenberg, MD

Professor, Department of Pediatrics, Section of Neonatology, University of Colorado School of Medicine and The Children's Hospital, Denver; Medical Director, Neonatal High Risk Follow-up Clinic; Medical Director, Newborn Service, University of Colorado Hospital, Denver Internet: adam.rosenberg@uchsc.edu The Newborn Infant

### Michael S. Schaffer, MD

Professor, Department of Pediatrics, Section of Pediatric Cardiology; Director of Pediatric Electrophysiology; University of Colorado School of Medicine and The Children's Hospital, Denver Internet: schaffer.michael@tchden.org

Cardiovascular Diseases

### Alan R. Seay, MD

Professor, Departments of Pediatrics and Neurology, University of Colorado School of Medicine and The Children's Hospital, Denver Internet: seay.alan@tchden.org

Neurologic & Muscular Disorders

### Eric J. Sigel, MD

Assistant Professor, Department of Pediatrics, Section of Adolescent Medicine; Co-Director, Eating Disorders Program at The Children's Hospital, Denver, and Clinical Director, Adolescent Clinic, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: sigel.eric@tchden.org

Eating Disorders; Sexually Transmitted Infections

### Eric A. F. Simoes, MD, DCH

Associate Professor, Department of Pediatrics, Section of Pediatric Infectious Diseases, University of Colorado School of Medicine and The Children's Hospital, Denver **Immunization** 

### Andrew P. Sirotnak, MD

Assistant Professor, Department of Pediatrics, University of Colorado School of Medicine; Director, Kempe Child Protection Team, The Children's Hospital, Denver

Internet: sirotnak.andrew@tchden.org

Child Abuse & Neglect

### Ronald J. Sokol, MD

Professor, Department of Pediatrics, Section of Pediatric Gastroenterology, Hepatology, and Nutrition and the Pediatric Liver Center and Liver Transplantation Programs; Program Director, Pediatric General Clinical Research Center; University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: sokol.ronald@tchden.org

Liver & Pancreas

### Henry M. Sondheimer, MD

Professor, Department of Pediatrics, University of Colorado School of Medicine; Director, Pediatric Cardiology Clinic, The Children's Hospital, Denver

Internet: sondheimer.henry@tchden.org

Cardiovascular Diseases

### Judith M. Sondheimer, MD

Professor, Department of Pediatrics, and Head, Section of Pediatric Gastroenterology, Hepatology, and Nutrition, University of Colorado School of Medicine and The Children's Hospital, Denver Internet: sondheimer.judith@tchden.org Gastrointestinal Tract

### Joel W. Steelman, MD

Fellow, Department of Pediatrics, Section of Pediatric Endocrinology, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: steelman.joel@tchden.org

**Endocrine Disorders** 

### Kurt R. Stenmark, MD

Professor, Department of Pediatrics, and Head, Section of Pediatric Clinical Care Medicine, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: kurt.stenmark@uchsc.edu

Critical Care

### Catherine Stevens-Simon, MD

Associate Professor, Department of Pediatrics, Section of Adolescent Medicine, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: stevens-simon.catherine@tchden.org

Substance Abuse in Pediatrics

### Janet M. Stewart, MD

Associate Professor Emerita, Department of Pediatrics, Section of Genetics, Metabolism, and Birth Defects, University of Colorado School of Medicine and The Children's Hospital, Denver Genetics & Dysmorphology

### Linda C. Stork, MD

Associate Professor, Department of Pediatrics, Section of Hematology, Oncology, and Bone Marrow Transplantation, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: stork.linda@tchden.org

Neoplastic Diseases

### Eva Sujansky, MD

Professor, Department of Pediatrics; Director, Genetics Residency and Fellowship, University of Colorado School of Medicine; Co-Director, Division of Genetic Services, and Director, Neurocutaneous Clinic, The Children's Hospital, Denver Internet: sujansky.eva@tchden.org

Genetics & Dysmorphology

### Elizabeth H. Thilo, MD

Associate Professor, Department of Pediatrics, Section of Neonatology, University of Colorado School of Medicine and The Children's Hospital, Denver; Medical Director of Nurseries, Centura-St. Anthony Central Hospital, Denver

Internet: thilo.elizabeth@tchden.org

The Newborn Infant

### Janet A. Thomas, MD

Assistant Prforessor, Department of Pediatrics, Section of Genetics, Metabolism, and Birth Defects, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: thomas.janet@tchden.org Inborn Errors of Metabolism

### Sharon H. Travers, MD

Assistant Professor of Pediatrics, Division of Pediatrics Endocrinology, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: travers.sharon@tchden.org

**Endocrine Disorders** 

### Adriana Weinberg, MD

Associate Professor, Departments of Pediatrics and Medicine, and Director, Diagnostic Virology Laboratory, University of Colorado School of Medicine, Denver

Internet: adriana.weinberg@uchsc.edu

Infections: Viral & Rickettsial Infections: Parasitic & Mycotic

### William L. Weston, MD

Professor and Chairman, Department of Dermatology, and Professor, Department of Pediatrics, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: william.weston@uchsc.edu

Skin

### Carl W. White, MD

Professor, Department of Pediatrics, Section of Pediatric Pulmonary Medicine, University of Colorado School of Medicine; Senior Faculty Member, National Jewish Medical and Research Center, Denver

Internet: whitec@njc.org

Respiratory Tract & Mediastinum

### Pamela E. Wilson, MD

Assistant Professor, Department of Rehabilitation Medicine, University of Colorado School of Medicine and The Children's Hospital, Denver Internet: wilson.pamela@tchden.org

Rehabilitation and Sports Medicine

### Robert R. Wolfe, MD

Professor, Department of Pediatrics, Section of Pediatric Cardiology, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: wolfe.robert@tchden.org

Cardiovascular Diseases

### Philip S. Zeitler, MD, PhD

Assistant Professor of Pediatrics, Section of Pediatric Endocrinology, University of Colorado School of Medicine and The Children's Hospital, Denver

Internet: phil.zeitler@uchsc.edu

**Endocrine Disorders** 

### Preface

The 15th edition of Current Pediatric Diagnosis & Treatment features practical, up-to-date, well-referenced information on the care of children from birth through infancy and adolescence. CPDT emphasizes the clinical aspects of pediatric care while also covering the important underlying principles. Its goal is to provide a guide to diagnosis, understanding, and treatment of the medical problems of all pediatric patients in an easy-to-use and readable format.

### INTENDED AUDIENCE

Like all Lange medical books, CPDT provides a concise yet comprehensive source of current information. Students will find CPDT an authoritative introduction to pediatrics and an excellent source for reference and review. Residents in pediatrics (and other specialties) will appreciate the detailed descriptions of diseases and diagnostic and therapeutic procedures. Pediatricians, family practitioners, nurses, and other health-care providers who work with infants and children also will find CPDT a useful reference on management aspects of pediatric medicine.

### COVERAGE

Forty-two chapters cover a wide range of topics, including neonatal medicine, child development and behavior, emergency and critical care medicine, and diagnosis and treatment of specific disorders according to major problems and organ systems. A wealth of tables and figures summarize such important information as acute and critical care procedures in the delivery room, the office, the emergency room, and the critical care unit; anti-infective agents; drug dosages; immunization schedules; differential diagnosis; and the development screening tests. The final chapter is a handy guide to normal laboratory values.

### **NEW TO THE EDITION**

The 15th edition of CPDT remains an up-to-date, comprehensive pediatric treatise, but this edition is the most comprehensive revision to date and a significant improvement of this classic book. The editors and contributing authors have continued to substantially revise the book, providing recent medical advances and increasing the book's emphasis on ambulatory care, acute critical care, and the practical approach to pediatric disorders. As editors and practicing pediatricians, we have tried to ensure that each chapter reflects the needs and realities of day-to-day practice.

New Chapters: Three new chapters deal with some of the most important and timely subjects in pediatric medicine today:

- 2. Child Development & Behavior
- 5. Eating Disorders
- 24. Rehabiliation & Sports Medicine

Chapter Revisions: Eight chapters have been extensively revised, with new authors added in several cases, reflecting substantial new information in each of their areas of pediatric medicine. These chapters are as follows:

- 1. The Newborn Infant
- 8. Office Pediatrics
- 9. Immunization
- 16. Ear, Nose, & Throat
- 18. Cadiovascular Diseases
- 28. Immunodeficiency
- 36. Human Immunodeficiency Virus (HIV) Infection

All other chapters are substantially revised and references have been updated. Fifteen new authors have been added to help with the revisions.

### **ACKNOWLEDGMENTS**

Karen Goselin and Rebecca Walter have provided invaluable assistance in our central office, helping to assure that all chapters were in order and processed in a timely fashion. Their excellent work was above and beyond the call of their normal duties, and we appreciate how much they have made our work on *CPDT* go so smoothly.

> William W. Hay, Jr., MD Anthony R. Hayward, MD, PhD Myron J. Levin, MD Judith M. Sondheimer, MD

Denver, Colorado August 2000

### Contents

Pre	eface	
1.	The Newborn Infant	
	Evaluation of the Newborn Infant 1 Care of the Well Newborn Infant 7 Common Problems in the Term Newborn Infant 11 Neonatal Intensive Care 22 Cardiac Problems in the Newborn Infant 38	Gastrointestinal & Abdominal Surgical Conditions in the Newborn Infant 41 Infections in the Newborn Infant 44 Hematologic Disorders in the Newborn Infant 53 Renal Disorders in the Newborn Infant 55 Neurologic Problems in the Newborn Infant 56 Metabolic Disorders in the Newborn Infant 58
2.	Child Development & Behavior	Edward Goldson, MD, & Randi J. Hagerman, MD
	Normal Development 60 The First Year 60 The Second Year 72 Language Development: Ages 1-4 Years 72 Early School Years: Ages 5-7 Years 73 Middle Childhood: Ages 7-11 Years 73 Behavioral & Developmental Variations 74 Normality & Temperament 74 Common Developmental Concerns 75 Colic 75	Feeding Disorders in Infants and Young Children 77 Sleep Disorders 78 Temper Tantrums & Breath-Holding Spells 80 Attention-Deficit/Hyperactivity Disorder 83 Mental Retardation 84 Specific Forms of Mental Retardation & Associated Treatment Issues 86
3. Adolescence		vid W. Kaplan, MD, MPH, & Kathryn A. Love, MD
	Demography 90 Mortality Data 90 Morbidity Data 90 Delivery of Health Services 92 Guidelines for Adolescent Preventive Services 92	Growth & Development 100 Behavior & Psychological Health 103 Breast Disorders 111 Gynecologic Disorders in Adolescence 114
4. Substance Abuse in Pediatrics		Catherine Stevens-Simon, MD
	Scope of the Problem 131 Morbidity Associated With Substance Abuse 135 Response to the Problem 136	Preventing the Progression from Use to Abuse 136 Prevention of Substance Abuse 137 Office-Based Treatment & Referral 142
5. Eating Disorders		Eric J. Sigel, MD
	Etiology 146 Incidence 146 Predisposing Factors 147	Diagnosis 147 Complications 150 Treatment 152
6.	Psychosocial Aspects of Pediatrics & Child & Adolescent Psychiatric Disorders	
	Family Life 155 Psychosocial Assessment of Children & Families 156 Screening for Psychosocial Problems & Psychiatric Disorders within the Context of Health Maintenance Visits 156 Developmental Disturbances & Concerns 160	Psychiatric Disorders 162 Somatoform Disorders 173 The Chronically Ill Child 178 Overview of Pediatric Psychopharmacology 180

7.	Child Abuse & Neglect	Andrew P. Sirotnak, MD, & Richard D. Krugman, MD	
	Forms of Child Maltreatment 190 Recognition of Abuse & Neglect 191	Management & Reporting of Child Abuse & Neglect 194 Prevention of Child Abuse & Neglect 194	
8.	Office Pediatrics		
	Pediatric History 196 Health Supervision Visits 199 Other Types of Office Visits 207	Evaluation of the Febrile Infant & Toddler 212 Growth Deficiency 213	
9.	Immunization		
	Standards for Pediatric Immunization Practices 215 Safety of Immunization 215 The Composition of Immunizing Agents 219 Poliomyelitis 227	Vaccinations for Special Situations 237 Passive Prophylaxis 246 Legal Issues in Immunization 248	
10.	Normal Childhood Nutrition & Its Disorders		
	Nutritional Requirements 249 Infant Feeding 262	Intravenous Nutrition 267	
11.	Emergencies, Injuries, & Poisoning	F. Keith Battan, MD, & Richard C. Dart, MD, PhD	
	Emergencies & Injuries 275 Advanced Life Support for Infants & Children 275 Emergency Pediatric Drugs 281 Approach to the Seriously Ill Child 281 Approach to the Pediatric Trauma Patient 283 Head Injury 287	Burns 289 Hypothermia 291 Submersion Injuries 292 Bites: Animal & Human 292 Poisoning 293 Management of Specific Common Poisonings 298	
12.	Critical Care  Todd C. Carpenter, MD, Emily L. Dobyns, MD, Anthony G. Durmowicz, MD,		
	Acute Respiratory Failure 319 Mechanical Ventilation 323 Adult Respiratory Distress Syndrome 325 Asthma (Life-Threatening) 328 Postoperative Cardiac Management 330 Shock 331	Margaret A. Ferguson, MD & Kurt R. Stenmark, MD  Indications for Central Venous & Arterial Cannulation 334 Cerebral Edema 337 Ethical Considerations in Intensive Care 339 Nutritional Support after Injury 340 Pain & Anxiety Control 340	
13.	Skin	Joseph G. Morelli, MD, & William L. Weston, MD	
	General Principles of Diagnosis of Skin Disorders 344 General Principles of Treatment of Skin Disorders 344	Disorders of the Skin in Newborns 346 Common Skin Diseases in Infants, Children, & Adolescents 350	
14.	Eye	Allen M. Fissenberger MD 6 D	
	Common Nonspecific Signs & Symptoms 363 Refractive Errors 363 Examination 365 Ocular Trauma 367 Injuries to the Eyelids 368 Disorders of the Ocular Structures 371 Disorders of the Nasolacrimal System 372 Diseases of the Conjunctiva 373 Disorders of the Iris 376 Glaucoma 377 Uveitis 377 AIDS & the Eye 378	Allan M. Eisenbaum, MD, & Donna B. Ornitz, MD  Disorders of the Cornea 379 Disorders of the Lens 379 Disorders of the Retina 380 Diseases of the Optic Nerve 382 Diseases of the Orbit 383 Nystagmus 384 Amblyopia & Strabismus 385 Unexplained Decreased Vision in Infants & Children 387 The Blind Child 387 Learning Disabilities & Dyslexia 388 Vision Screening 388	

15.	Oral Medicine & Dentistry	William A. Mueller, DMD	390
	Oral Examination of the Newborn & Infant 390	Dental Caries & Periodontal Disease 394	
16.	Ear, Nose, & Throat		400
	The Ear 400 The Nose & Paranasal Sinuses 414	The Throat & Oral Cavity 419	
17.	· · · · · · · · · · · · · · · · · · ·	D, Frank J. Accurso, MD, Robin R. Deterding, MD, D, Gwendolyn S. Kerby, MD, & Carl W. White, MD	428
	Respiratory Tract 428 Growth & Development 428 Diagnostic Aids 429 General Therapy of Pediatric Lung Diseases 432 Disorders of the Conducting Airways 433 Congenital Disorders of the Extrathoracic Airway 434 Acquired Disorders of the Extrathoracic Airway 435 Congenital Disorders of the Intrathoracic Airways 438	Acquired Disorders of the Intrathoracic Airways 439 Congenital Malformations of the Lung 449 Acquired Disorders Involving Alveoli 451 Diseases of the Pulmonary Circulation 463 Disorders of the Chest Wall 466 Disorders of the Pleura & Pleural Cavity 468 Disorders of the Control of Breathing 470 Mediastinum 473 Mediastinitis 473 Mediastinal Masses 474	
18.	B. Cardiovascular Diseases Henry M. Sondheimer, MD, Mark M. Boucek, MD, D. Dunbar Ivy, MD, Angela Lorts, MD, Michael S. Schaffer, MD & Robert R. Wolfe, MD		.476
	Diagnostic Evaluation 476 Major Clues to Heart Disease in Infants & Children 486 Congenital Heart Disease 488	Acquired Heart Disease 515 Cardiac Transplantation 524 Disorders of Rate & Rhythm & of Electrolyte Imbalance 525	
19.	. Gastrointestinal Tract		.538
	Evaluation of the Child With Vomiting 538 Gastroesophageal Reflux 538 Achalasia of the Esophagus 539 Caustic Burns of the Esophagus 540 Hiatal Hernia 540 Pyloric Stenosis 540 Peptic Disease 541 Congenital Diaphragmatic Hernia 542 Congenital Duodenal Obstruction 542 Congenital Intestinal Atresias & Stenoses 543 Annular Pancreas 543 Intestinal Malrotation With or Without Volvulus 544 Meckel Diverticulum & Omphalomesenteric Duct Remnants 544 Duplications of the Gastrointestinal Tract 545 Congenital Aganglionic Megacolon (Hirschsprung Disease) 545 Chylous Ascites 546	Congenital Anorectal Anomalies 547 Acute Abdomen 547 Peritonitis 548 Acute Appendicitis 548 Intussusception 549 Foreign Bodies in the Alimentary Tract 550 Anal Fissure 550 Inguinal Hernia 550 Umbilical Hernia 551 Tumors of the Gastrointestinal Tract 551 Acute Infectious Diarrhea (Gastroenteritis) 553 Chronic Diarrhea 554 The Malabsorption Syndromes 556 Constipation 561 Gastrointestinal Bleeding 562 Recurrent Abdominal Pain 564 Inflammatory Bowel Disease 565	
20.	Liver & Pancreas  Ronald J. Sokol, MD, & Michael R. Narkewicz, MD		.569
	Prolonged Neonatal Cholestatic Jaundice 569 Intrahepatic Cholestasis 569 Extrahepatic Neonatal Cholestasis 575 Other Neonatal Hyperbilirubinemic Conditions (Noncholestatic Nonhemolytic) 578 Hepatitis A 580 Hepatitis B 582 Hepatitis C 583 Hepatitis D (Delta Agent) 584 Hepatitis E 584	Other Hepatitis Viruses 585 Fulminant Hepatitis (Acute Massive Hepatic Necrosis, Acute Yellow Atrophy) 585 Autoimmune Hepatitis (Lupoid Hepatitis) 586 Steatohepatitis 588 Cirrhosis 588 Alpha <sub>1</sub> -Antitrypsin Deficiency Liver Disease 589 Biliary Tract Disease 590 Pyogenic & Amebic Liver Abscess 594 Portal Hypertension 595	

	Hepatoma 598 Wilson Disease (Hepatolenticular Degeneration) 599	Chronic Pancreatitis 603 Gastrointestinal & Hepatobiliary Manifestations of Cystic Fibrosis 604
	Reye Syndrome (Encephalopathy with Fatty Degeneration of the Viscera) 600	Syndromes With Pancreatic Exocrine Insufficiency 604
	Liver Transplantation 602 Pancreas 602	Isolated Exocrine Pancreatic Enzyme Defect 607 Pancreatic Tumors 607
	Acute Pancreatitis 602	
21.	. Kidney & Urinary Tract	Gary M. Lum, MD
	Evaluation of the Kidney & Urinary Tract 609 Congenital Anomalies of the Urinary Tract 613 Hematuria & Glomerular Disease 614 Proteinuria & Renal Disease 616 Diseases of the Renal Vessels 618 Hemolytic-Uremic Syndrome 618	Renal Failure 619 Renal Hypertension 623 Inherited or Developmental Defects of the Urinary Tract 625 Urinary Tract Infections 630
22.	Neurologic & Muscular Disorders	Paul G. Moe, MD, & Alan R. Seay, MD
	Neurologic Assessment & Neurodiagnostic Procedures 632 Disorders Affecting the Nervous System in Infants & Children 637	Infections & Inflammatory Disorders of the Central Nervous System 679 Disorders of Childhood Affecting Muscles 689 Miscellaneous Neuromuscular Disorders 695
23.	Orthopedics	Robert E. Eilert, MD
	Disturbances of Prenatal Origin 699 Growth Disturbances of the Musculoskeletal System 704 Degenerative Problems (Arthritis, Bursitis, & Tenosynovitis) 707	Infections of the Bones & Joints 711 Vascular Lesions & Avascular Necrosis (Osteochondroses) 713 Neurologic Disorders Involving the Musculoskeletal System 715
24.	Trauma 707  Rehabilitation & Sports Medicine	Miscellaneous Diseases of Bone 717
		Dennis J. Matthews, MD, & Pamela E. Wilson, MD
	Basic Principles 719 Common Sports Medicine Issues & Injuries 726 Infectious Diseases 726 Head & Neck Injuries 726 Back Injuries 727 Shoulder Injuries 727	Elbow & Forearm Injuries 727 Hand & Wrist Injuries 728 Hip Injuries 729 Knee Injuries 730 Foot & Ankle Injuries 731 Prevention 732
25.	Rheumatic Diseases	J. Roger Hollister, MD
	Juvenile Rheumatoid Arthritis (Juvenile Chronic Arthritis) 733  Spondyloarthropathy 735  Enteropathic Arthritis 735  Systemic Lupus Erythematosus 736	Polyarteritis Nodosa 738 Scleroderma 738 Raynaud Phenomenon 739 Nonrheumatic Pain Syndromes 739
	Dermatomyositis (Polymyositis) 737	Hypermobility Syndrome 740
26.	Hematologic Disorders	
	Bone Marrow Failure 741 Anemias 744 Polycythemia & Methemoglobinemia 764 Disorders of Leukocytes 766	Bleeding Disorders 770 Thrombotic Disorders 782 The Spleen 783 Transfusion Medicine 784
<b>27</b> .	Neoplastic Disease	`.; `. `. `. `
	Euythe A. Albano,	MD, Linda C. Stork, MD, Brian S. Greffe, MD, CM, Lorrie F. Odom, MD, & Nicholas K. Foreman, MD
]	Lymphomas and lymphoproliferative Disorders 801 Michael B. Jordan, MD	
Ŧ	Hematopoietic Stem Cell Transplantation 815 Douglas K. Graham, MD, PhD, Roger H. Gille	r MD & Doloh D Ovinses see
1	Late Effects of Pediatric Cancer Therapy 816	י, יאיט, א רזמוטוו ח. Wulliones, MD

28.	Immunodeficiency	Anthony R. Hayward, MD, PhD	
	Nonspecific Factors in Resistance to Infection 820	Other Disorders Associated with Immunodeficiency 829	
	Deficiencies of Specific Immunity 822 Combined Immunodeficiency Disorders 827	Secondary Immunodeficiency 831 Investigation of Immunodeficiency 832	
29.		), Sharon H. Travers, MD, Philip S. Zeitler, MD, PhD	
	General Concepts 835 Hormone Types 835 Disturbances of Growth 836 The Posterior Pituitary Gland 841	The Thyroid Gland 843 Disorders of Calcium Homeostasis 849 The Gonads (Ovaries & Testes) 856 Adrenal Cortex 863	
30.	Diabetes Mellitus		
	Essentials of Diagnosis & Typical Features 874 General Considerations 874 Etiology 874 Diagnosis 875	Treatment 875 Laboratory Evaluations 877 Acute Complications 878 Chronic Complications 880	
31.	Inborn Errors of Metabolism		
	Diagnosis 881 Management of Metabolic Emergencies 885 Newborn Screening 886 Disorders of Carbohydrate Metabolism 886 Primary Lactic Acidemias & Other Disorders of Energy Metabolism 888 Disorders of Amino Acid Metabolism 889 Organic Acidemias 894	Disorders of Fatty Acid Oxidation & Carnitine 897 Disorders of Purine Metabolism 899 Lysosomal Diseases 899 Peroxisomal Diseases 901 Carbohydrate-Deficient Glycoprotein Syndromes 902 Smith-Lemli-Opitz Syndrome 902	
32.	Genetics & Dysmorphology		
	Chromosomes & Cell Divisions 904 Chromosome Preparation & Analysis 904 Chromosome Nomenclature 906 Chromosome Abnormalities 906 Abnormalities of Autosomes 909 Abnormalities of Sex Chromosomes 911 Recurrence Risks 912 Other Chromosome Abnormalities 912 Principles of Recombinant DNA 913 Application of Recombinant DNA Technologies in Clinical Genetics 914	Mendelian Genetics 915 Single-Gene Defects 915 Mitochondrial Inheritance 920 Polygenic Disease (Mulitfactoral Inheritance) 922 Dysmorphology 926 Mechanisms 926 Clinical Dysmorphology 929 Genetic Counseling 936 Prenatal Diagnosis 937	
33.	Allergic Disorders		
	The Allergic Cascade 939 Major Allergic Disorders Seen in Pediatric Practice 939 Asthma 939 Allergic Rhinitis 948 Atopic Dermatitis 950	Urticaria & Angioedema 954 Anaphylaxis 956 Adverse Reactions to Drugs & Biologicals 958 Food Allergy 962 Insect Allergy 963	
34.	Antimicrobial Therapy		
	Principles of Antimicrobial Therapy 965 Antimicrobial Susceptibility Testing 966 Alteration of Dose & Measurement of Blood Levels 968 The Use of New Antimicrobial Agents 970	Prophylactic Antimicrobial Agents 973 Initial Empiric Antimicrobial Choices for Selected Conditions 975 Specific Antimicrobial Agents 976	