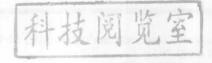
10th EDITION

Handbook of Nonprescription D R U G S

Handbook of Nonprescription Drugs

10 th EDITION





Published by

AMERICAN PHARMACEUTICAL ASSOCIATION

The National Professional Society of Pharmacists 2215 Constitution Avenue, NW Washington, DC 20037



Timothy R. Covington, Pharm.D.

Pharmaceutical Editor

Laura C. Lawson

Managing Editor

Linda L. Young

Assistant Managing Editor

Susan C. Kendall

Editorial Coordinator

William B. Mason

Design and Production Artist

James V. McGinnis

Manager of Art and Production

James P. Caro

Senior Director, Division of Programming and Publications

Database Development: Benjamin J. Bluml, Cygnus Systems Development Inc.

Product Table Research: Jennifer L. Brown, Stacy Ferguson, Jaspconia G. Florence

Database Entry: Jaspconia G. Florence, Azadeh S. Kaider

Desktop Publishing Consultant: Thomas J. Piwowar & Associates, Inc.

Editorial Services: EEI

Anatomic Drawings: Walter Hilmers, Jr., and Judith M. Guenther, with Alexa L. Chun

Color Illustration Contributors: Jean A. Borger, Richard C. Childers, Stanley Cullen, Alfred C. Griffin (deceased), Harold L. Hammond, R. Gary Sibbald

Printing: Quebecor America Book Group

Library of Congress Catalog Number 86-640099 ISSN 0889-7816 ISBN 0-917330-63-3

© Copyright 1993, American Pharmaceutical Association, 2215 Constitution Avenue, NW, Washington, DC 20037 © 1967, 1969, 1971, 1973, 1977, 1979, 1982, 1986, 1990

No portion of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means now known or by any future method without prior written permission from the publisher. Requests to reproduce or use data or information from this text should be sent to *Handbook of Nonprescription Drugs*, American Pharmaceutical Association, 2215 Constitution Avenue, NW, Washington, DC 20037. A nominal fee may be assessed for processing of such requests.

Although many individual items of information contained herein may be found in other sources, the material as presented in this format is unique and available nowhere else. The compilation and arrangement of the information in a convenient and readily accessible format represent an extensive amount of staff resources, judgment, effort, and time, and contribute to the originality of the text. The book is fully copyrighted.

The editors and publisher are not responsible for any inaccuracy of quotation or for any false or misleading implication that may arise due to others' use of material in this edition, or due to the quotation of material from editions no longer official.

Handbook of Nonprescription Drugs

10th EDITION

TURE OTHER IN TENTAL CRISE CONSIDERATION OF THE PARTY OF

other modules, is to use unitial carried letters to beet about in the little of

the brief or tor consequences within their land land and a land

tele ted to the kinding and manufactive a most quitant product informati

The editors, join in lend contributors have written this house in their posalist aparties. No official support of endureers in by uniterioral or state

errent et toblide ner la ama sometigen keimile ben dag est groen plegne. Le valeure, sin en de en ablet nem Landene, pergide edille del atroctus en agrit beride en estre anti-me en bekreene monten. Ad

Notices

The inclusion in this book of any drug in respect to which patent or trademark rights may exist shall not be deemed, and is not intended as a grant of or authority to exercise, any right or privilege protected by such patent or trademark. All such rights or trademarks are vested in the patent or trademark owner, and no other person may exercise the same without express permission, authority, or license secured from such patent or trademark owner.

The listing of selected brand names is intended only for ease of reference. The listed brand names are a representative sampling of drug products, not a comprehensive listing. The inclusion of a brand name does not mean the editors or publisher has any particular knowledge that the brand listed has properties different from other brands of the same drug, nor should its inclusion be interpreted as an endorsement by the editors or publisher. Similarly, the fact that a particular brand has not been included does not indicate the product has been judged to be in any way unsatisfactory or unacceptable.

The convention followed in this book to identify brand names of drugs and other products is to use initial capital letters (when appropriate) and/or trademarks. Nonproprietary, generic, or common names of such articles are cited without initial capitalization or trademarks.

The nature of drug information is that it is constantly evolving because of ongoing research and clinical experience and is often subject to interpretation. Although great care has been taken to ensure the accuracy of the information presented herein, the reader is advised that the authors, editors, reviewers, contributors, and publisher cannot be held responsible for the continued currency of the information or for any errors or omissions in this book or for any consequences arising therefrom. Readers are advised that decisions regarding drug therapy must be based on the independent judgment of the clinician, changing information about a drug, (e.g., as reflected in the literature and manufacturer's most current product information), and changing medical practices.

The editors, authors, and contributors have written this book in their private capacities. No official support or endorsement by any federal or state agency or pharmaceutical company is intended or inferred.



Advisory Panel, Authors & Reviewers

Advisory Panel

William L. Blockstein, Ph.D.

Professor Emeritus, School of Pharmacy, University of Wisconsin–Madison, Madison, Wisconsin

L. N. "Red" Camp, III, B.S. Pharmacy

Pharmacist, Camp Pharmacy, Titusville, Florida

Bernadette Eichelberger, Pharm.D.

Clinical Pharmacy Coordinator, Kaiser Permanente, Washington, DC

Janet P. Engle, Pharm.D.

Assistant Dean, College of Pharmacy, University of Illinois at Chicago, Chicago, Illinois

Edward G. Feldmann, Ph.D.

Pharmaceutical Consultant Services, Falls Church, Virginia

Benjamin J. Gruda, B.S. Pharmacy, R.Ph.

Pharmacist, Fays Drugs, Potsdam, New York

Kenneth W. Lem, Pharm.D.

Associate Dean for Educational Affairs, Lecturer in Clinical Pharmacy, School of Pharmacy, University of California, San Francisco, California

1 The Self-Care Movement

Authors

Gary A. Holt, R.Ph., M.Ed., Ph.D.

Assistant Professor of Pharmacy Practice, School of Pharmacy, Samford University, Birmingham, Alabama

Edwin L. Hall, Ph.D.

Professor of Pharmacy Administration, School of Pharmacy, Samford University, Birmingham, Alabama

Reviewers

Peter P. Lamy, Ph.D., Sc.D.

Director, The Center for the Study of Pharmacy and Therapeutics for the Elderly, School of Pharmacy, University of Maryland, Baltimore, Maryland

Richard P. Penna, Pharm.D.

Associate Executive Director, American Association of Colleges of Pharmacy, Alexandria, Virginia

Dorothy L. Smith, Pharm.D.

President, Consumer Health Information Corporation, McLean, Virginia

2 Patient Assessment and Consultation

Authors

Wendy Klein-Schwartz, Pharm.D.

Associate Professor of Pharmacy Practice, School of Pharmacy, University of Maryland, Baltimore, Maryland

J. Michael Hoopes, Pharm.D.

Vice President, Drug Counter Pharmacies, Gaithersburg, Maryland

Reviewers

Danial E. Baker, Pharm.D.

Director, Drug Information Center, College of Pharmacy, Washington State University at Spokane, Spokane, Washington

Virginia J. Galizia, Ph.D.

Associate Clinical Professor, College of Pharmacy and Allied Health Professions, St. John's University, Jamaica, New York

William C. Gong, Pharm.D.

Associate Professor of Clinical Pharmacy, School of Pharmacy, University of Southern California, Los Angeles, California

Daniel A. Hussar, Ph.D.

Remington Professor of Pharmacy, Philadelphia College of Pharmacy and Science, Philadelphia, Pennsylvania

Michael Montagne, Ph.D.

Director, Center for Drug Education, Associate Professor of Social Pharmacy, College of Pharmacy and Allied Health Professions, Northeastern University, Boston, Massachusetts

Gilbert N. Weise, B.S. Pharmacy, F.A.C.P.

Pharmacist, Weise Pharmacy, Jacksonville, Florida

3 FDA's Review of OTC Drugs

Author

William E. Gilbertson, Pharm.D.

Director, Division of OTC Drug Evaluation, Food and Drug Administration, Rockville, Maryland

Reviewers

David B. Brushwood, J.D.

Professor of Pharmacy Health Care Administration, College of Pharmacy, University of Florida, Gainesville, Florida

Joseph L. Fink III, B.S. Pharmacy, J.D.

Associate Vice Chancellor for Academic Affairs, University of Kentucky, Lexington, Kentucky

Jesse C. Vivian, J.D.

Associate Professor, College of Pharmacy and Allied Health Professions, Wayne State University, Detroit, Michigan

Gary L. Yingling, Esquire

Partner, McKenna & Cuneo, Washington, DC

4 In-Home Testing and Monitoring Products

Author

Susan M. Meyer, Ph.D.

Director of Academic Affairs, American Association of Colleges of Pharmacy, Alexandria, Virginia

Reviewers

Wesley G. Byerly, Pharm.D.

Director, Drug Information Service, North Carolina Baptist Hospital, Winston–Salem, North Carolina **Stephen M. Caiola, M.S.**

Associate Professor of Pharmacy Practice, School of Pharmacy, University of North Carolina, Chapel Hill, North Carolina

Betsy A. Carlisle, Pharm.D.

Clinical Assistant Professor, University of Texas at Austin, Austin, Texas

Diane Nykamp, Pharm.D.

Associate Professor of Pharmacy Practice, Southern School of Pharmacy, Mercer University, Atlanta, Georgia

Captain Wynn W. Waite, Pharm.D.

Chief, Inpatient and Clinical Pharmacy Services, United States Air Force, Scott AFB, Illinois

5 Internal Analgesic Products

Author

W. Kent Van Tyle, Ph.D.

Professor of Pharmacology, College of Pharmacy, Butler University, Indianapolis, Indiana

Reviewers

Ann B. Amerson, Pharm.D.

Professor, College of Pharmacy, University of Kentucky, Lexington, Kentucky

Joseph Greensher, M.D., F.A.A.P.

Medical Director and Associate Chairman, Professor of Pediatrics, Department of Pediatrics, Winthrop— University Hospital, Mineola, New York

Peter J. S. Koo, Pharm.D.

Pharmacist Specialist, Pain Management, Associate Clinical Professor of Pharmacy, University of California, San Francisco, California

Arthur G. Lipman, Pharm.D.

Professor of Clinical Pharmacy, College of Pharmacy, University of Utah, Salt Lake City, Utah

James K. Marttila, Pharm.D., M.B.A.

Pharmacy Director, Mayo Pharmacy System, Mayo Foundation for Medical Education and Research, Rochester, Minnesota

6 Antipyretic Drug Products

Author

Thomas E. Lackner, Pharm.D., F.A.S.C.P

Vice President of Consulting—Midwest, Pharmacy Corporation of America, Minneapolis, Minnesota

Reviewers

Richard D. Leff, Pharm.D., F.C.C.P.

Associate Professor of Pediatrics and Pharmacy Director, Pediatric Pharmacology, University of Kansas Medical Center, Kansas City, Kansas

Larry M. Lopez, Pharm.D., F.C.C.P.

Associate Professor of Pharmacy, College of Pharmacy, University of Florida, Gainesville, Florida

Robert L. Snively, B.S. Pharmacy

Consultant Pharmacist, Edgehill Pharmacy, Georgetown, Delaware

W. Kent Van Tyle, Ph.D.

Professor of Pharmacology, College of Pharmacy, Butler University, Indianapolis, Indiana

Donald B. Wiest, Pharm.D.

Associate Professor of Pharmacy, College of Pharmacy, Medical University of South Carolina, Charleston, South Carolina

Menstrual Products

Author

Leslie A. Shimp, Pharm.D., M.S.

Associate Professor of Pharmacy, College of Pharmacy, The University of Michigan, Ann Arbor, Michigan

Reviewers

Charma A. Konnor, Pharm.D.

Director, Division of Drug Quality Evaluation, Food and Drug Administration, Rockville, Maryland

Connie Lee Barnes, Pharm.D.

Assistant Professor, School of Pharmacy, Campbell University, Buies Creek, North Carolina

Constance A. McKenzie, Pharm.D.

Director, Drug Information, School of Pharmacy, Campbell University, Buies Creek, North Carolina Rosalie Sagraves, Pharm.D.

Associate Professor of Pharmacy Practice, Adjunct Associate Professor of Pediatrics, College of Pharmacy, University of Oklahoma Health Sciences Center, Oklahoma City, Oklahoma

Geralynn B. Smith, M.S.

Assistant Professor, College of Pharmacy and Allied Health Professions, Wayne State University, Detroit, Michigan

8 Cold, Cough, and Allergy Products

Authors

Bobby G. Bryant, Pharm.D.

Associate Professor, Albany College of Pharmacy, Union University, Albany, New York

Thomas P. Lombardi, Pharm.D.

Clinical Pharmacy Coordinator, Department of Pharmacy, St. Peter's Hospital, Albany, New York

Reviewers

Jeffrey C. Delafuente, M.S.

Associate Professor and Associate Chairman, College of Pharmacy, University of Florida, Gainesville, Florida

Alex Gringauz, R.Ph., Ph.D.

Professor of Medicinal Chemistry, Arnold & Marie Schwartz College of Pharmacy and Health Sciences, Long Island University, Brooklyn, New York H. Won Jun, Ph.D.

Professor of Pharmaceutics, College of Pharmacy, The University of Georgia, Athens, Georgia

Raymond W. Roberts, Pharm.D.

Director, Home Infusion Services, FoxMeyer Corporation, Carrollton, Texas

Karen J. Tietze, Pharm.D.

Associate Professor of Clinical Pharmacy, Philadelphia College of Pharmacy and Science, Philadelphia, Pennsylvania

9 Asthma Products

Authors

H. William Kelly, Pharm.D.

Professor of Pharmacy, College of Pharmacy, University of New Mexico, Albuquerque, New Mexico

Mary Beth O'Connell, Pharm.D.

Associate Professor, College of Pharmacy, University of Minnesota, Minneapolis, Minnesota

Reviewers

Sandra M. Gawchik, D.O.

Co-Director, Division of Allergy & Immunology, Crozer Chester Medical Center, Chester, Pennsylvania

Pamela A. Simon, Pharm.D.

Clinical Assistant Professor, College of Pharmacy, University of Illinois at Chicago, Chicago, Illinois **Craig S. Stern, Pharm.D.**

President, ProPharma Pharmaceutical Consultants, Northridge, California

Mark Stiling, R.Ph., Pharm.D.

Clinical Pharmacy Coordinator, Ireland Army Community Hospital, Fort Knox, Kentucky

10 Sleep Aid and Stimulant Products

Authors

M. Lynn Crismon, Pharm.D.

Professor and Head, Clinical Division at Austin, College of Pharmacy, University of Texas at Austin, Austin, Texas

Donna M. Jermain, Pharm.D.

Clinical Pharmacist, Assistant Professor, Scott and White Hospital, Texas A&M University, Temple, Texas

Reviewers

Kenneth Bachmann, Ph.D., F.C.P.

Professor of Pharmacology, College of Pharmacy, The University of Toledo, Toledo, Ohio

Patricia A. Camazzola, Pharm.D.

Director, Department of Pharmacy, Huron Valley Hospital, Milford, Michigan

Alice L. Paysinger, Pharm.D.

Assistant Professor of Clinical Pharmacy Practice, School of Pharmacy, The University of Mississippi, University, Mississippi

Barbara G. Wells, Pharm.D.

Associate Professor and Vice Chair, College of Pharmacy, University of Tennessee, Memphis, Tennessee

Michael Z. Wincor, Pharm.D.

Assistant Professor of Clinical Pharmacy, Psychiatry and the Behavioral Sciences, Schools of Pharmacy and Medicine, University of Southern California, Los Angeles, California

11 Antacid Products

Authors

Julianne B. Pinson, Pharm. D.

Assistant Professor of Pharmacy Practice, School of Pharmacy, Campbell University, Reynolds Health Center, Winston–Salem, North Carolina

C. Wayne Weart, Pharm.D.

Professor of Community Pharmacy Practice, Associate Professor of Family Medicine, Medical University of South Carolina, Charleston, South Carolina

Reviewers

Stephen M. Caiola, M.S.

Associate Professor of Pharmacy Practice, School of Pharmacy, University of North Carolina, Chapel Hill, North Carolina

Bruce C. Carlstedt, Ph.D.

Associate Professor of Clinical Pharmacy, School of Pharmacy and Pharmacal Sciences, Purdue University, West Lafayette, Indiana

Bruce D. Clayton, Pharm.D.

Associate Dean, Professor of Pharmacy Practice, College of Pharmacy, Butler University, Indianapolis, Indiana

Roy C. Parish, Pharm.D.

Assistant Professor, College of Pharmacy, The University of Georgia, Athens, Georgia

Pamela A. Simon, Pharm.D.

Clinical Assistant Professor, College of Pharmacy, University of Illinois at Chicago, Chicago, Illinois

12 Emetic and Antiemetic Products

Authors

Gary M. Oderda, Pharm.D., M.P.H.

Professor and Chairman, Department of Pharmacy Practice, College of Pharmacy, University of Utah, Salt Lake City, Utah

Jenifer C. Jennings, Pharm.D.

Assistant Professor of Clinical Pharmacy, Department of Pharmacy Practice, College of Pharmacy, University of Utah, Salt Lake City, Utah

Reviewers

Betsy A. Carlisle, Pharm.D.

Clinical Assistant Professor, University of Texas at Austin, Austin, Texas

William D. King, R.Ph., M.P.H., Dr.P.H.

Associate Professor of Pediatrics, School of Medicine, University of Alabama–Birmingham, Birmingham, Alabama

Alan H. Lau, Pharm.D.

Associate Professor and Research Coordinator, College of Pharmacy, University of Illinois at Chicago, Chicago, Illinois

Anthony J. Silvagni, D.O., Pharm.D.

Professor of General Practice and Clinical Pharmacology, College of Osteopathic Medicine, University of Health Science, Kansas City, Missouri **Anthony R. Temple, M.D.**

Executive Director, Medical, McNeil Consumer Products Company, Fort Washington, Pennsylvania

13 Antidiarrheal Products

Author

R. Leon Longe, Pharm.D.

Professor, College of Pharmacy, The University of Georgia, Athens, Georgia

Reviewers

Mark L. Britton, Pharm.D.

Clinical Pharmacy Coordinator, Department of Veterans Affairs Medical Center, Oklahoma City, Oklahoma

Joseph T. DiPiro, Pharm.D.

Professor of Pharmacy, University of Georgia, Augusta, Georgia

Herbert L. DuPont, M.D.

Mary W. Kelsey Professor and Director, Center for Infectious Diseases, School of Public Health, The University of Texas Medical School, Houston, Texas

Wayne A. Kradjan, Pharm.D.

Associate Dean, School of Pharmacy, University of Washington, Seattle, Washington

John J. Piecoro, Jr., Pharm.D., M.S.

Professor, Division of Pharmacy Practice and Science, College of Pharmacy, University of Kentucky, Lexington, Kentucky

14 Anthelmintic Products

Author

Kathryn K. Bucci, Pharm.D.

Assistant Clinical Professor in Community and Family Medicine, Duke University, Durham, North Carolina

Reviewers

J. Fred Bennes, B.S. Pharmacy

Director of Pharmacy Services, The Health Care Plan, Inc., Buffalo, New York

Donald O. Fedder, B.S.P., M.P.H., Dr.P.H.

Professor and Director of Community Pharmacy Programs, School of Pharmacy, University of Maryland, Baltimore, Maryland

Robert A. Mangione, M.S.

Assistant Dean of Pharmacy Student Affairs, Clinical Professor of Pharmacy, College of Pharmacy and Allied Health Professions, St. John's University, Jamaica, New York

David E. Stewart, Pharm.D.

Vice President, Stewart's Pharmacy, Inc., McMinnville, Tennessee

15 Laxative Products

Authors

Clarence E. Curry, Jr., Pharm.D.

Associate Professor of Pharmacy Practice, College of Pharmacy and Pharmacal Sciences, Howard University, Washington, DC

Demetris Tatum-Butler, Pharm.D.

Clinical Pharmacy Coordinator, Greater Laurel–Beltsville Hospital, Laurel, Maryland

Reviewers

R. Randolph Beckner, Pharm.D., M.H.A.

Manager, Quality Assurance Department of Pharmacy, Barnes Hospital, St. Louis, Missouri **Eddie L. Boyd, Pharm.D., M.S.**

Associate Dean, College of Pharmacy, Xavier University of Louisiana, New Orleans, Louisiana

Anthony T. Buatti, B.S. Pharmacy, M.B.A.

Assistant Professor of Health Care Administration, College of Pharmacy and Allied Health Professions, St. John's University, Jamaica, New York

Janice A. Gaska, Pharm.D.

Adjunct Associate Professor of Clinical Pharmacy, Philadelphia College of Pharmacy and Science, Philadelphia, Pennsylvania

Katheryn W. Russi, M.P.A.

Director, Division of Pharmacy Practice, College of Pharmacy, Drake University, Des Moines, Iowa

16 Diabetes Care Products and Monitoring Devices

Authors

John R. White, Jr., Pharm.D.

Assistant Professor of Pharmacy Practice, College of Pharmacy, Washington State University at Spokane, Spokane, Washington

R. Keith Campbell, M.B.A., C.D.E.

Associate Dean, Professor of Pharmacy Practice, College of Pharmacy, Washington State University, Pullman, Washington

Reviewers

Charles Y. McCall, Pharm.D.

Associate Professor, College of Pharmacy, The University of Georgia, Athens, Georgia

David A. Sclar, B.S. Pharmacy, Ph.D.

Assistant Professor of Health Care Administration, College of Pharmacy, Washington State University, Pullman, Washington

Kenneth A. Skau, Ph.D.

Associate Professor of Pharmacology, College of Pharmacy, University of Cincinnati—Medical Center, Cincinnati, Ohio

Condit F. Steil, Pharm.D., C.D.E.

Clinical and Consultant Pharmacist, Pharmacy Corner, Ashland, Kentucky

Michael S. Torre, B.S. Pharmacy, M.Sc.

Clinical Professor of Pharmacy and Chairman, Department of Clinical Pharmacy Practice, College of Pharmacy and Allied Health Professions, St. John's University, Jamaica, New York

17 Nutritional Products

Author

Loyd V. Allen, Jr., Ph.D.

Professor & Head, Pharmaceutics, College of Pharmacy, University of Oklahoma, Oklahoma City, Oklahoma

Reviewers

Carl J. Malanga, Ph.D.

Associate Dean for Academic Affairs and Administration, School of Pharmacy, West Virginia University Health Sciences Center, Morgantown, West Virginia

Merlin V. Nelson, Pharm.D.

Department of Pharmacy Practice, College of Pharmacy and Allied Health Professions, Wayne State University, Detroit, Michigan

Gail H. Rosen, Pharm.D.

Director, Nutrition Support Services, Department of Pharmacy Services, University of Maryland Medical System, Baltimore, Maryland

J. Ken Walters, Jr., Pharm.D.

Director of Pharmacy, Sheppard Pratt Hospital, Baltimore, Maryland

18 Infant Formula Products

Authors

Rosalie Sagraves, Pharm.D.

Associate Professor of Pharmacy Practice, Adjunct Associate Professor of Pediatrics, College of Pharmacy, University of Oklahoma Health Sciences Center, Oklahoma City, Oklahoma

Claudia Kamper, Pharm.D.

Assistant Professor, College of Pharmacy, University of Oklahoma, Oklahoma City, Oklahoma

Judi Doerr, R.D., L.D.

Pediatric Clinical Dietitian, Children's Hospital of Oklahoma, Oklahoma City, Oklahoma

Reviewers

F. James Grogan, Pharm.D.

Clinical Pharmacist, IVT_x , St. Louis, Missouri

Cynthia S. Kirman, Pharm.D.

Drug Information Specialist, Clinical Pharmacy Services, Value $R_{\rm x}$ Pharmacy Program, Bloomfield Hills, Michigan

Donna F. Veal, Pharm.D.

Assistant Professor, School of Pharmacy, Samford University, Birmingham, Alabama

Paul C. Walker, Pharm.D.

Adjunct Assistant Professor, College of Pharmacy and Allied Health Professions, Wayne State University, Detroit, Michigan

19

Weight Control Products

Author

Glenn D. Appelt, Ph.D., R.Ph., F.A.C.A.

Pharmacology Consultant, Boulder Beach Consulting Group, Gulf Shores, Alabama

Reviewers

Robert L. Beamer, Ph.D.

Professor of Medicinal Chemistry and Biochemistry, College of Pharmacy, University of South Carolina, Columbia, South Carolina

Patricia A. Camazzola, Pharm.D.

Director, Department of Pharmacy, Huron Valley Hospital, Milford, Michigan

William S. Lackey, B.S. Pharmacy

Retired Pharmacist, Past President of A.C.A., Tucson, Arizona

Nancy A. Letassy, Pharm.D.

Assistant Professor of Pharmacy Practice, College of Pharmacy, University of Oklahoma, Oklahoma City, Oklahoma

Leon Shargel, Ph.D.

Director of Pharmacokinetics, Chelsea Laboratories, Inc., West Hempstead, New York

20 Ophthalmic Products

Authors

Jimmy D. Bartlett, O.D., D.O.S.

Associate Professor of Optometry, School of Optometry, University of Alabama at Birmingham, Birmingham, Alabama

Mark W. Swanson, O.D.

Assistant Professor, Department of Optometry, University of Alabama at Birmingham, Birmingham, Alabama

Reviewers

Chris Bapatla, Ph.D.

Assistant Director, Pharmacy Sciences, Alcon Laboratories, Inc., Fort Worth, Texas

Alexander F. Demetro, Pharm.D.

Pharmacist, Westwood Prescriptionists, San Jose, California

Richard G. Fiscella, R.Ph., M.P.H.

Assistant Professor of Pharmacy Practice, College of Pharmacy, University of Illinois at Chicago, Chicago, Illinois

Ralph W. Trottier, Ph.D., J.D.

Professor and Attorney at Law, Morehouse School of Medicine, Atlanta, Georgia

John R. Yuen, Pharm.D.

Nuclear Pharmacist, Syncor International Corporation, Los Angeles, California

21 Contact Lens Products

Author

Janet P. Engle, Pharm.D.

Assistant Dean and Clinical Associate Professor of Pharmacy Practice, College of Pharmacy, University of Illinois at Chicago, Chicago, Illinois

Reviewers

William J. Benjamin, O.D., Ph.D.

Associate Professor, School of Optometry, University of Alabama at Birmingham, Birmingham, Alabama Timothy Lesar, Pharm.D.

Assistant Director of Pharmacy, Albany Medical Center, Albany, New York

Thomas F. Patton, Ph.D.

Director, Pharmaceutical R&D, Merck & Co., Inc., Rahway, New Jersey

Captain Wynn W. Waite, Pharm.D.

Chief, Inpatient and Clinical Pharmacy Services, United States Air Force, Scott AFB, Illinois John R. Yuen, Pharm.D.

Nuclear Pharmacist, Syncor International Corporation, Los Angeles, California

22 Otic Products

Author

Keith O. Miller, Pharm.D.

Pharmacy Department, Wadley Regional Medical Center, Texarcana, Texas

Reviewers

Carl F. Emswiller, Jr., B.S. Pharmacy

Pharmacist, Emswiller Pharmacy, Leesburg, Virginia

E. Paul Larrat, Ph.D.

Assistant Professor of Epidemiology, College of Pharmacy, University of Rhode Island, Kingston, Rhode Island

Michael S. Maddux, Pharm.D.

Assistant Dean for Clinical Development, St. Louis College of Pharmacy, St. Louis, Missouri

Dennis Richmond, M.D.

Lafayette Family Physicians, Lafayette, Indiana

Ralph W. Trottier, Ph.D., J.D.

Professor and Attorney at Law, Morehouse School of Medicine, Atlanta, Georgia

23 Oral Health Products

Arlene A. Flynn, B.S. Pharmacy, B.S. Biology, M.Ed.

Assistant to the Dean, College of Pharmacy, University of Illinois at Chicago, Chicago, Illinois

Reviewers

Paul L. Doering, M.S.

Professor of Pharmacy Practice, College of Pharmacy, University of Florida, Gainesville, Florida Lowell S. Lakritz, D.D.S.

Private Practitioner, General Dentistry, Madison, Wisconsin

Roger H. Scholle, D.D.S.

Editor, Illinois State Dental Society, Springfield, Illinois

Carl Stone, D.D.S., M.A.

Associate Professor, School of Dentistry, University of Detroit Mercy, Detroit, Michigan

Kenneth W. Witte, Pharm.D.

Clinical Assistant Professor, Department of Pharmacy Practice, College of Pharmacy, University of Illinois at Chicago, Chicago, Illinois

24 Ostomy and Wound Care Products

Authors

Michael L. Kleinberg, M.S., F.A.S.H.P.

Director of Professional Services, Immunex Corporation, Seattle, Washington

Moya J. Vazquez, R.N., M.B.A

Product Manager, Immunex Corporation, Seattle, Washington

Reviewers

George B. Browning, B.S. Pharmacy

President, Medical Arts Pharmacy, Inc., Melbourne, Florida

Mary M. Losey, M.S.

Director, Office of Student Services, School of Pharmacy and Pharmacal Sciences, Purdue University, West Lafayette, Indiana

Gary Schmidt, B.S. Pharmacy

Clinical Instructor, University of Wisconsin–Madison, Madison, Wisconsin

Joan Lerner Selekof, R.N., B.S.N., C.E.T.N.

Enterostomal Therapy Nurse, University of Maryland Medical System, Baltimore, Maryland

25 Contraceptive Methods and Products

Authors

Louise Parent-Stevens, Pharm.D.

Clinical Assistant Professor, College of Pharmacy, University of Illinois at Chicago, Chicago, Illinois Roberta S. Carrier, Pharm.D.

Assistant Professor, School of Pharmacy, University of Wisconsin–Madison, Madison, Wisconsin

Reviewers

Sandra H. Hak, Pharm.D.

President, ProPharma, Ltd., Germantown, Tennessee

David L. Lourwood, Pharm.D.

Clinical Assistant Professor of Pharmacy Practice, College of Pharmacy, University of Illinois at Chicago, Chicago, Illinois

Daniel R. Mishell, Jr., M.D.

Lyle G. McNeile Professor and Chairman, Department of Obstetrics and Gynecology, School of Medicine, University of Southern California, Los Angeles, California

Timothy D. Moore, M.S., R.Ph.

Senior Director and Clinical Professor, Department of Pharmacy, The Ohio State University Hospitals, Columbus, Ohio

Ronald J. Ruggiero, Pharm.D.

Associate Clinical Professor, School of Pharmacy, University of California, San Francisco, California

26 Hemorrhoidal Products

Author

Benjamin Hodes, Ph.D.

Professor of Pharmaceutics and University Director, Division of Continuing Education, Duquesne University, Pittsburgh, Pennsylvania

Reviewers

Thomas D. DeCillis, B.S. Pharmacy

Pharmacist Director (Retired), U.S. Public Health Service, North Port, Florida

Ross L. Egger, M.D.

Medical Director, St. John's Health Care Corporation, St. Johns Hospital, Anderson, Indiana

Anthony Palmieri III, Ph.D.

Director, Intellectual Property, The Upjohn Company, Kalamazoo, Michigan

Quentin M. Srnka, Pharm.D., M.B.A.

Director, Center for Pharmacy Management and Research, College of Pharmacy, University of Tennessee, Memphis, Tennessee

Larry N. Swanson, Pharm.D.

Professor and Chairman, Department of Pharmacy Practice, School of Pharmacy, Campbell University, Buies Creek, North Carolina

27 Personal Care Products

Authors

Donald R. Miller, Pharm.D.

Associate Professor of Pharmacy Practice, College of Pharmacy, North Dakota State University, Fargo, North Dakota

Mary Kuzel, Pharm.D.

Assistant Clinical Professor of Pharmacy Practice, North Dakota State University, Fargo, North Dakota

Reviewers

Linda C. Hogan, M.S.

Director of Licensing, Marion Merrell Dow Inc., Kansas City, Missouri

Alan W. Hopefl, Pharm.D.

Associate Professor of Pharmacy Practice, St. Louis College of Pharmacy, St. Louis, Missouri

Lawrence A. Lemchen, R.Ph.

Clinical Consultant Pharmacist, Pharmacy Corporation of America, Seattle, Washington

Geralynn B. Smith, M.S.

Assistant Professor, College of Pharmacy and Allied Health Professions, Wayne State University, Detroit, Michigan

Linda Gore Sutherland, M.B.A., R.Ph.

Coordinator, Drug Information, School of Pharmacy, University of Wyoming, Laramie, Wyoming

28 Topical Anti-Infective Products

Authors

Dennis P. West, Ph.D., F.C.C.P.

Vice-President, Scientific Affairs, GenDerm Corporation, Lincolnshire, Illinois

Susan V. Maddux, Pharm.D.

Clinical Pharmacy Coordinator, Group Health Plan, St. Louis, Missouri

Reviewers

Miriam P. Calhoun, B.S.

Consultant, Pharmaceutical Regulatory Affairs, Food and Drug Administration (Retired), Potomac, Maryland

Robert J. Cluxton, Pharm.D.

Associate Professor, College of Pharmacy, University of Cincinnati—Medical Center, Cincinnati, Ohio

Howard Maibach, M.D.

Professor of Dermatology, Dermatology Department, University of California Hospital, San Francisco, California

Karen I. Plaisance, Pharm.D.

Associate Professor, School of Pharmacy, University of Maryland, Baltimore, Maryland

Marilyn K. Speedie, Ph.D.

Professor, School of Pharmacy, University of Maryland, Baltimore, Maryland

29 Acne Products

Author

Joye Ann Billow, Ph.D.

Professor of Pharmaceutical Sciences, College of Pharmacy, South Dakota State University, Brookings, South Dakota

Reviewers

Darrell F. Bennett, B.S. Pharmacy, R.Ph.

Pharmacist, California Poly Health Center, California

Polytechnic State University, San Luis Obispo, California

Mary E. Gross, Pharm.D.

Associate Professor of Clinical Pharmacy–Geriatric Pharmacy, College of Pharmacy and Health Science, Drake University, Des Moines, Iowa

Henry A. Palmer, Ph.D.

Clinical Professor, School of Pharmacy, The University of Connecticut, Storrs, Connecticut

Charles D. Ponte, R.Ph., Pharm.D., C.D.E.

Professor of Clinical Pharmacy and Family Medicine, School of Pharmacy, West Virginia University Health Sciences Center, Morgantown, West Virginia

J. Richard Wuest, Pharm.D., R.Ph.

Professor of Clinical Pharmacy, University of Cincinnati—Medical Center, Cincinnati, Ohio

30 Dermatologic Products

Author

Joye Ann Billow, Ph.D.

Professor of Pharmaceutical Sciences, College of Pharmacy, South Dakota State University, Brookings, South Dakota

Reviewers

J. Fred Bennes, B.S. Pharmacy

Director of Pharmacy Services, The Health Care Plan, Inc., Buffalo, New York

Emery W. Brunett, Ph.D.

School of Pharmacy, University of Wyoming, Laramie, Wyoming

George E. Francisco, Pharm.D.

Associate Professor and Associate Dean, College of Pharmacy, The University of Georgia, Athens, Georgia

Anthony J. Lamonica, B.S. Pharmacy

President, Prescription Shoppe, Inc.—ACA, Everett, Massachusetts

31 Diaper Rash and Prickly Heat Products

Author

Gary H. Smith, Pharm.D.

Professor of Pharmacy Practice, College of Pharmacy, The University of Arizona, Tucson, Arizona

Reviewers

Timothy J. Boehmer, B.S. Pharmacy

Staff Pharmacist, Providence Hospital, Anchorage, Alaska

John A. Bosso, Pharm.D., F.C.C.P.

Professor and Vice Chair for Research, Hospital Pharmacy Practice and Administration, Medical University of South Carolina, Charleston, South Carolina

Miriam P. Calhoun, B.S.

Consultant, Pharmaceutical Regulatory Affairs, Food and Drug Administration (Retired), Potomac, Maryland

Debra Ricciatti-Sibbald, M.S.

President, Debary Dermatologicals, Mississaugua, Ontario

Paul C. Walker, Pharm.D.

Adjunct Assistant Professor, College of Pharmacy and Allied Health Professions, Wayne State University, Detroit, Michigan

32 External Analgesic Products

Author

Arthur I. Jacknowitz, Pharm.D.

Professor and Chairman, Department of Clinical Pharmacy, School of Pharmacy, West Virginia University Health Sciences Center, Morgantown, West Virginia

Reviewers

Martin D. Higbee, Pharm.D.

Associate Professor, College of Pharmacy, The University of Arizona, Tucson, Arizona

Phillip R. Oppenheimer, Pharm.D.

Associate Dean, School of Pharmacy, University of Southern California, Los Angeles, California

W. Steven Pray, Ph.D.

Professor of Pharmaceutics, School of Pharmacy, Southwestern Oklahoma State University, Weatherford, Oklahoma

Martha M. Rumore, Pharm.D., J.D.

Associate Professor, Pharmacy Administration, Arnold & Marie Schwartz College of Pharmacy and Health Sciences, Long Island University, Brooklyn, New York

Craig S. Stern, Pharm.D.

President, ProPharma Pharmaceutical Consultants, Northridge, California

33 Burn and Sunburn Products

Author

Robert H. Moore III, Ph.D.

Professor of Pharmacology, School of Pharmacy, Samford University, Birmingham, Alabama

Reviewers

Robert W. Bennett, M.S.

Associate Professor of Clinical Pharmacy, Department of Pharmacy Practice, School of Pharmacy and Pharmacal Sciences, Purdue University, West Lafayette, Indiana

Julie Rivkin Berman, Pharm.D.

Clinical Specialist—Burn Unit, Detroit Receiving Hospital and University Health Center, Detroit, Michigan

Miriam P. Calhoun, B.S.

Consultant, Pharmaceutical Regulatory Affairs, Food and Drug Administration (Retired), Potomac, Maryland

Walter T. Gloor, Ph.D.

Adjunct Professor, School of Pharmacy and Allied Health Professions, Creighton University, Omaha, Nebraska

Katheryn W. Russi, M.P.A.

Director, Division of Pharmacy Practice, College of Pharmacy, Drake University, Des Moines, Iowa

34 Sunscreen and Suntan Products

Author

Edward M. DeSimone II, Ph.D.

Associate Professor of Administration and Social Sciences, Assistant Dean for Academic Affairs, School of Pharmacy and Allied Health Professions, Creighton University, Omaha, Nebraska

Reviewers

Julie Rivkin Berman, Pharm.D.

Clinical Specialist—Burn Unit, Detroit Receiving Hospital and University Health Center, Detroit, Michigan

Martin J. Jinks, Pharm.D.

Professor and Chair, Pharmacy Practice Department, College of Pharmacy, Washington State University, Pullman, Washington

Linda K. McCoy, Pharm.D.

Manager of Clinical Pharmacy Services, Good Samaritan Regional Medical Center, Phoenix, Arizona **Katheryn W. Russi, M.P.A.**

Director, Division of Pharmacy Practice, College of Pharmacy, Drake University, Des Moines, Iowa

Stewart B. Siskin, Pharm.D.

Associate Director, Clinical Research, Bristol–Myers Squibb Company Pharmaceutical Research Institute, Buffalo, New York

35 Poison Ivy and Poison Oak Products

Author

Henry Wormser, Ph.D.

Professor of Pharmaceutical Chemistry, College of Pharmacy and Allied Health Professions, Wayne State University, Detroit, Michigan

Reviewers

David C. Beck, M.D.

Clinical Assistant Professor of Dermatology, School of Medicine, Indiana University, West Lafayette, Indiana

Jerry D. Karbeling, B.S. Pharmacy

Community Pharmacist, Big Creek Pharmacy, Polk City, Iowa

Kenneth R. Keefner. Ph.D., R.Ph.

Associate Professor, School of Pharmacy and Allied Health Professions, Creighton University, Omaha, Nebraska

Robert B. Sause, Ph.D.

Associate Professor, College of Pharmacy and Allied Health Professions, St. John's University, Jamaica, New York

Joel L. Zatz, Ph.D.

Professor of Pharmaceutics, College of Pharmacy, Rutgers University, The State University of New Jersey, Piscataway, New Jersey

36 Insect Sting and Bite Products

Author

Farid Sadik, Ph.D.

Professor and Associate Dean, College of Pharmacy, University of South Carolina, Columbia, South Carolina

Reviewers

Virginia J. Galizia, Ph.D.

Associate Clinical Professor, College of Pharmacy and Allied Health Professions, St. John's University, Jamaica, New York

Howard Maibach, M.D.

Professor of Dermatology, Dermatology Department, University of California Hospital, San Francisco, California

James R. Morse, M.S.

Assistant Professor, College of Pharmacy, The University of Arizona, Tucson, Arizona

Victor A. Padron, R.Ph., Ph.D.

Associate Professor of Pharmacy Practice, School of Pharmacy and Allied Health Professions, Creighton University, Omaha, Nebraska

Robert B. Sause, Ph.D.

Associate Professor, College of Pharmacy and Allied Health Professions, St. John's University, Jamaica, New York

37 Foot Care Products

Author

Nicholas G. Popovich, Ph.D.

Professor and Head, Department of Pharmacy Practice, School of Pharmacy and Pharmacal Sciences, Purdue University, West Lafayette, Indiana

Reviewers

Donald O. Fedder, B.S.P., M.P.H., Dr.P.H.

Professor and Director of Community Pharmacy Programs, School of Pharmacy, University of Maryland, Baltimore, Maryland

Thomas J. Holmes, Jr., Ph.D.

Associate Professor, School of Pharmacy, Campbell University, Buies Creek, North Carolina

Edward R. Hommel, D.P.M.

Clinical Assistant Professor, Department of Family Medicine, School of Medicine, University of Wisconsin–Madison, Madison, Wisconsin

Damien Howell, M.S., P.T.

Damien Howell Physical Therapy, Richmond, Virginia

Preface

The goals of the American Pharmaceutical Association include advancing standards of pharmacy practice; fostering safe, effective, appropriate, and economical nonprescription drug use; and expanding professional practice prerogatives of pharmacists. These goals are assisted substantially by publication of the *Handbook of Nonprescription Drugs*. The 10th Edition of the *Handbook* has refined and updated the world's most comprehensive drug information database dealing exclusively with nonprescription drugs. Conscientious use of the *Handbook* by pharmacists and pharmacy students will foster optimal pharmacotherapy, advance the evolution of pharmaceutical care, and serve the public health.

In an era of health care reform and cost containment, numerous issues concerning quality and cost of health care present opportunities to pharmacists. One of these areas is management of self-limiting conditions with nonprescription drugs. Consumers want and need more information on the appropriate use of these agents. New strategies and initiatives are needed to optimize self-care with nonprescription pharmaceuticals. The pharmacist is the most qualified and appropriate *learned intermediary* to help the patient with optimal use of nonprescription drugs.

Pharmacists are strategically positioned in health care to assess patient needs, recognize conditions that are self-treatable with nonprescription drugs, and advise and counsel patients. If self-care with a nonprescription drug is appropriate, the pharmacist is generally available and well qualified to:

- Help in product selection;
- Assess patient risk factors;
- Counsel patients regarding proper use;
- Monitor for drug allergies or hypersensitivities, adverse drug reactions, and drugdrug interactions;
- Monitor response to therapy;
- Assess clinical outcomes:
- Discourage use of fraudulent or quack remedies;
- Assess the ability of a nonprescription drug to mask symptoms of a serious medical condition;
- Prevent delays in seeking medical attention by referring the patient to a physician.

Nonprescription drug sales at the wholesale level were approximately \$12 billion in 1991 and \$13.2 billion in 1992. Sales are projected to increase 8–10% per year and, by 1996, could increase by \$4–5 billion. Factors fostering such sales growth are the projected reclassification of numerous prescription drugs to nonprescription status, the availability and positive public perception of the pharmacist, the emerging growth of the self-care movement, and the ever increasing safety and efficacy of the nation's supply of nonprescription drugs due in large part to the FDA-coordinated OTC Drug Review.

The pharmacist's clinical competency relative to the provision of cognitive informational services to patients on safe, appropriate, effective, and economical nonprescription drug use is vital. The 10th Edition of the *Handbook of Nonprescription Drugs* is the greatest single tool available to enhance professional competence and expand patient services in the domain of nonprescription pharmacotherapy. The American Pharmaceutical Association is pleased to offer this valued resource and pledges an ongoing commitment to further expansion and refinement of this publication.

John A. Gans, Pharm.D. Executive Vice-President American Pharmaceutical Association