

THE MERCK MANUAL

VOLUME II

Obstetrics
Gynecology
Pediatrics
Genetics

Fourteenth
Edition

MSD

FOURTEENTH EDITION

THE
MERCK
MANUAL

OF
DIAGNOSIS AND THERAPY

VOLUME II

GYNECOLOGY OBSTETRICS
PEDIATRICS GENETICS

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Published by
MERCK SHARP & DOHME RESEARCH LABORATORIES

Division of
MERCK & CO., INC.
Rahway, N.J.

1982

MERCK & CO., INC.
Rahway, N.J.
U.S.A.

MERCK SHARP & DOHME
West Point, Pa.

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Rahway, N.J.

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ALGINATE INDUSTRIES LIMITED
London, England

BALTIMORE AIRCOIL COMPANY, INC.
Baltimore, Md.

CALGON CORPORATION
Pittsburgh, Pa.

KELCO DIVISION
San Diego, Calif.

Library of Congress Catalog Card Number 1-31760

ISBN Number 911910-05-0

ISSN Number 0076-6526

First Printing—June 1982

Second Printing—March 1983

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FOURTEENTH EDITION

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4th Edition - 1911
5th Edition - 1923
6th Edition - 1934
7th Edition - 1940

8th Edition - 1950
9th Edition - 1956
10th Edition - 1961
11th Edition - 1966
12th Edition - 1972
13th Edition - 1977
14th Edition - 1982

VOLUME II

GYNECOLOGY

OBSTETRICS

PEDIATRICS

GENETICS

FOREWORD TO VOLUMES I AND II

These two volumes together contain all of the 14th Edition of THE MERCK MANUAL, with the text rearranged to solve a problem most often encountered by medical students and house officers, to whom these volumes are specifically dedicated. THE MANUAL—probably the most widely used medical text in the world—has steadily grown in size and become too large to be carried conveniently in a jacket pocket or small medical bag. Dividing the book into two smaller volumes provides greater portability for those users who are constantly confronted with a variety of complex problems and need instant access to a pocket-sized reference text.

The objectives of THE MERCK MANUAL have always been ambitious. It covers not only disorders of interest to general internists, but also clinical pharmacology, psychiatry, ophthalmology, otorhinolaryngology, dermatology, dental disorders, special subjects (e.g., clinical procedures, laboratory medicine, radiation reactions and injuries, dental emergencies, and biostatistics), obstetrics, gynecology, and pediatrics. Since the book is used worldwide, more subjects are covered than would be required for a purely domestic text. Furthermore, disease discussions include relevant data about incidence, epidemiology, etiology, pathophysiology, symptoms and signs, and laboratory data, as well as differential diagnosis and treatment. Review of the physical examination, the analysis of symptoms and signs, and the approach to patients with various types of disorders, as well as basic information about major technologic advances, are also discussed in detail. Despite this extraordinary coverage, the size of the book has been well controlled, but achieving pocket-size required a new approach.

Rather than sacrifice coverage, we are offering our readers more choices. The 14th Edition is available in a single volume with a hard cover, as in the past. Additionally, the book has been divided into these two smaller volumes: Volume I covers General Medicine and related subspecialty subjects, while Volume II is limited mainly to Gynecology, Obstetrics, Pediatrics, and Genetics. Some subjects (e.g., poisoning, tables of laboratory values, weights and measures, and certain disease discussions) are reproduced in *both* volumes, for the convenience of the user.

Abbreviations and symbols, used liberally as essential space savers, are listed on pp. xl and xli.

The basic quality of the text, which relates to the excellence of our Editorial Board and distinguished authors, as well as to extensive review procedures, remains the same in the two smaller volumes as that in the single, larger text. We hope you will find these smaller volumes to be of value.

Robert Berkow, M.D.

NOTICE

The authors, reviewers, editors, and publisher of these books have made extensive efforts to ensure that treatments, drugs, and dosage regimens are accurate and conform to the standards accepted at the time of publication. However, constant changes in information resulting from continuing research and clinical experience, reasonable differences in opinions among authorities, unique aspects of individual clinical situations, and the possibility of human error in preparing such an extensive text require that the reader exercise individual judgment when making a clinical decision and, if necessary, consult and compare information from other sources. In particular, the reader is advised to check the product information included in each package of a drug product before prescribing or administering it, especially if the drug is unfamiliar or is used infrequently.

FOREWORD TO EDITION 14

THE MERCK MANUAL first appeared in 1899 as a slender 262-page text titled *MERCK'S MANUAL OF THE MATERIA MEDICA*. It was expressly designed to meet the needs of general practitioners in selecting medications, noting that "memory is treacherous" and even the most thoroughly informed physician needs a reminder "to make him at once master of the situation and enable him to prescribe exactly what his judgment tells him is needed for the occasion." It was well received and, by the 6th Edition (1934), THE MERCK MANUAL had become highly valued by medical students and house staff also; by the end of World War II the pocket-sized manual was an established favorite ready-reference. Today THE MANUAL is the most widely used medical text in the world. While the book has grown to about 2500 pages, its primary purpose remains the same—to provide useful information to practicing physicians, medical students, interns, residents, and other health professionals.

Fewer physicians now attempt to manage the whole range of medical disorders that can occur in infants, children, and adults, but those who do must have available a broad spectrum of current and accurate information. The specialist requires precise information about subjects outside his area of expertise. All physicians need more and more information for study and examination purposes as well as for patient care. THE MERCK MANUAL continues to try to meet these needs, excluding only details of surgical procedures.

Precisely how do we attempt to meet these needs? First, from a disease orientation, THE MANUAL covers all but the most obscure disorders of mankind, not only those that a general internist might expect to encounter, but also problems of pregnancy and delivery, the more common and serious disorders of neonates, infants, and children, and many special situations. Disorders are mainly organized according to the organ systems primarily affected, on the basis of their etiology (as with most of the infectious diseases and disorders due to physical agents), or on the basis of disciplines (e.g., gynecology, obstetrics, pediatrics, genetics, psychiatry). In addition, THE MANUAL contains information for special circumstances, such as radiation reactions and injuries, problems encountered in deep-sea diving, or dental emergencies. New subjects continue to be added, such as discussions of the principles of clinical biostatistics, Legionnaires' disease, toxic shock syndrome, and geriatric disorders. In fact, this edition has about 400 pages (approximately 20%) more text than the preceding edition. We therefore urge you to check the Index whenever you require information, even on unusual subjects or those not commonly found in other texts.

A completely disease-oriented compendium, however, would have serious limitations. Since patients usually present with complaints or concerns that must be meticulously described, sorted, and deciphered, many chapters are devoted to discussions of symptoms and signs and how to elicit the historical and physical data required for diagnosis. Common clinical procedures and laboratory tests used as diagnostic and management aids are described and are supplemented with information on proper specimen collection and handling. As new and sophisticated laboratory and technologic procedures come forth (e.g., computerized tomography, isotope scanning, ultrasound, mediastinoscopy), they are also described, with comments on their uses, interpretations, and limitations.

Current therapy is presented for each disorder and supplemented with a separate section on clinical pharmacology that describes general principles, new advances (e.g., the role of drug receptors, plasma concentration monitoring), details of pharmacologic groups and specific agents, and even suggestions for prescription writing and the use of placebos. When complex equipment (e.g., respirators, dialyzers) is involved, it is also described. Prophylaxis is emphasized wherever possible. Finally, reference guides are provided for checking normal values, calculating dosages, and converting weights, measures, and volumes to metric equivalents.

Can so many subjects be covered adequately in a single book? You, the reader, must make the ultimate judgment, but we believe the answer is in the affirmative.

This edition required a concerted effort by many people, beginning with an internal analysis and critique of the previous edition, even though it enjoyed highly favorable reviews and outstanding reader acceptance. Almost every section of that book was then sent to outside experts, who had had nothing to do with its preparation, to solicit their most candid criticism. Published reviews and letters received from readers were analyzed. Next, the Editorial Board met to compare reviews and critiques and to plan this 14th Edition. Distinguished special consultants were enlisted to provide additional expertise. Then, 272 authors with outstanding qualifications, experience, and knowledge were engaged. Their manuscripts were edited repeatedly in-house to retain every valuable morsel of knowledge while eliminating sometimes elegant, but unneeded, words. Each manuscript was then reviewed by a member of the Editorial Board or a consultant. In many cases, additional special reviewers were invited to comment. Every mention of a drug and its dosage was reviewed by a separate outside consultant. The objectives of all these reviews were to ensure adequate and relevant coverage of each subject, accuracy, and simple and clean exposition. The authors then reworked, modified, and polished their manuscripts. Almost all of the manuscripts were revised at least 6 times; 15 to 20 revisions were not uncommon. We believe that no other medical text undergoes as many reviews and revisions as *THE MERCK MANUAL*.

The foregoing is a simplified review of the complex, arduous, and rewarding 4^{1/2}-year enterprise that culminates in the presentation of this 14th Edition of *THE MERCK MANUAL*. The members of the Editorial Board, special consultants, contributing authors, and in-house editorial staff and their affiliations are listed on the pages that follow. They deserve a degree of gratitude that cannot be adequately expressed here, but we know they will feel sufficiently rewarded if their efforts serve your needs.

We hope this edition of *THE MERCK MANUAL* will be a welcome aid to you, our readers—compatible with your needs and worthy of frequent use. Suggestions for improvements will be warmly welcomed and carefully considered.

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ABBREVIATIONS AND SYMBOLS

ACTH	adrenocorticotrophic hormone	Hg	mercury
ADH	antidiuretic hormone	HI	hemagglutination-inhibition, inhibiting
ADP	adenosine diphosphate	HLA	human leukocyte group A
ASO	antistreptolysin O (titer)	Hz	hertz (cycles/second)
ATP	adenosine triphosphate	ICF	intracellular fluid
BCG	Bacillus Calmette-Guerin (vaccine)	IgA, etc.	immunoglobulin A, etc.
b.i.d.	2 times a day	IM	intramuscular(ly)
BMR	basal metabolic rate	IPPB	inspiratory positive pressure breathing
BP	blood pressure	IU	international unit
BSA	body surface area	IV	intravenous(ly)
BSP	sulfobromophthalein	IVP	intravenous pyelogram
BUN	blood urea nitrogen	K	potassium
C	Celsius; centigrade; complement	kcal	kilocalorie (food calorie)
Ca	Calcium	kg	kilogram
CBC	complete blood count	17-KGS	17-ketogenic steroids
CF	complement fixation, fixing	17-KS	17-ketosteroids
Ch.	chapter	L	liter
Cl	curie	lb	pound
Cl	chloride; chlorine	LDH	lactic dehydrogenase
cm	centimeter	LE	lupus erythematosus
CNS	central nervous system	m	meter
CO	carbon monoxide; cardiac output	M	molar
CO₂	carbon dioxide	mCi	millicurie
CPK	creatine phosphokinase	MCH	mean corpuscular hemoglobin
CPR	cardiopulmonary resuscitation	MCHC	mean corpuscular hemoglobin concentration
CSF	cerebrospinal fluid	MCV	mean corpuscular volume
CT	computed tomography	mEq	milliequivalent
cu	cubic	mg	milligram
cu mm	cubic millimeter	Mg	magnesium
D & C	dilation and curettage	MIC	minimum inhibitory concentration
dl	deciliter (= 100 ml)	min	minute
DNA	deoxyribonucleic acid	mlU	milli-international unit
DTP	diphtheria-tetanus-pertussis (toxoids/vaccine)	ml	milliliter
D/W	dextrose in water	MLD	minimum lethal dose
ECF	extracellular fluid	mm	millimeter
ECG	electrocardiogram	mM	millimole
EEG	electroencephalogram	mo	month
ENT	ear, nose, and throat	mol wt	molecular weight
ESR	erythrocyte sedimentation rate	mOsm	milliosmole
F	Fahrenheit	MRC	Medical Research Council (units)
FDA	U.S. Food and Drug Administration	N	nitrogen; normal (strength of solution)
ft	foot; feet (measure)	Na	sodium
FUO	fever of unknown origin	ng	nanogram (= millimicrogram)
GFR	glomerular filtration rate	nm	nanometer (= millimicron)
GI	gastrointestinal	17-OHCS	17-hydroxycorticosteroids
gm	gram	OTC	over-the-counter (pharmaceuticals)
G6PD	glucose-6-phosphate dehydrogenase	oz	ounce
GU	genitourinary	P	phosphorus; pressure
h	hour	P_{CO2}	carbon dioxide pressure (or tension)
HA	hemagglutination, hemagglutinating	P_{O2}	oxygen pressure (or tension)
Hb	hemoglobin	Pa_{CO2}	arterial carbon dioxide pressure
HCl	hydrochloric acid; hydrochloride	Pa_{O2}	arterial oxygen pressure
HCO₃	bicarbonate	Pa_{O2}	alveolar oxygen pressure
Hct	hematocrit		

pg	picogram (=micromicrogram)
pH	hydrogen-ion concentration
p o	orally
PPD	Purified Protein Derivative (tuberculin)
ppm	parts per million
p.r.n.	as needed
psi	pounds per square inch
PSP	phenolsulfonphthalein
q	every
q 4 h, etc.	every 4 hours, etc.
q.i.d.	4 times a day
R, r	roentgen
RA	rheumatoid arthritis
RBC	red blood cell
RF	rheumatic fever; rheumatoid factor
RNA	ribonucleic acid
Sa _{O₂}	arterial oxygen saturation
SBE	subacute bacterial endocarditis
s.c.	subcutaneous(ly)
SGOT	serum glutamic oxaloacetic transaminase
SGPT	serum glutamic pyruvic transaminase
SLE	systemic lupus erythematosus
sp gr	specific gravity
sq	square

sq m	square meter
STS	serologic test(s) for syphilis
TB	tuberculosis
tblsp	tablespoon
t.i.d.	3 times a day
tsp	teaspoon
u.	unit
URI	upper respiratory infection
USPHS	United States Public Health Service
UTI	urinary tract infection
WBC	white blood cell
WHO	World Health Organization
wk	week
wt	weight
yr	year
μ	micro-
μm	micrometer; micron
mμ	millimicron (=nanometer)
μCi	microcurie
μg	microgram
μmol	micromole
μOsm	micro-osmole
/	per
<	less than
>	more than
≤	equal to or less than
≥	equal to or more than
≈	approximately equal to
±	plus or minus
§	section

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Associate Clinical Professor of Pediatrics, University of Southern California; Consultant, Los Angeles Children's Hospital; Staff Pediatrician, Kaiser Foundation Hospital

Acute Infectious Neonatal Diarrhea

Elizabeth R. McAnarney, M.D.

George Washington Goler Associate Professor of Pediatrics and Director, Division of Biosocial Pediatrics/Adolescent Medicine, University of Rochester

The Adolescent

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

Professor and Chairman, Department of Obstetrics and Gynecology, University of Southern California

Family Planning

John A. Moncrief, M.D. (Deceased)

Professor of Surgery, University of Texas, San Antonio

Burns

Gary J. Myers, M.D.

Associate Professor of Pediatrics, University of Alabama in Birmingham

Birth Trauma; The Newborn—Seizure Disorders; Congenital Anomalies—General Considerations, Musculoskeletal Defects, and Neurologic Defects

Don H. Nelson, M.D.

Professor of Medicine and Head, Division of Endocrinology and Metabolism, University of Utah

Congenital Adrenal Hyperplasia

Stephen E. Oshrin, Ph.D.

Associate Professor of Audiology, University of Southern Mississippi

Clinical Measurement of Hearing in Children

Robert F. Pass, M.D.

Assistant Professor of Pediatrics, University of Alabama in Birmingham

Congenital Rubella; Congenital and Perinatal Cytomegalovirus Infection; Congenital Toxoplasmosis

John A. Penner, M.D.

Professor of Internal Medicine and Director, Division of Hematology—Oncology, Michigan State University

Hereditary Coagulation Disorders

Hart deC. Peterson, M.D.

Clinical Associate Professor of Neurology and Pediatrics, New York Hospital—Cornell Medical Center

Acute Bacterial Meningitis; Acute Viral Encephalitis and Aseptic Meningitis; Cerebral Palsy Syndromes; Muscular Atrophies, Dystrophies, and Related Disorders; Cerebral Palsy Syndromes; Muscular Atrophies, Dystrophies, and Related Disorders

Fred Plum, M.D.

Anne Parrish Titzell Professor of Neurology, Cornell University; Neurologist-in-Chief, New York Hospital

Seizure Disorders

C. George Ray, M.D.

Professor of Pathology and Pediatrics, University of Arizona

Measles; Rubella; Roseola Infantum; Erythema Infectiosum; Chickenpox; Smallpox; Enteroviral Diseases; Mumps; Mucocutaneous Lymph Node Syndrome; Pertussis

Stanley E. Read, M.D., Ph.D.

Associate Professor of Pediatrics, University of Toronto, Toronto, Ontario; Adjunct Associate Professor, The Rockefeller University

Acute Bacterial Meningitis; Acute Viral Encephalitis and Aseptic Meningitis

Safa M. Rifka, M.D.

Assistant Professor, Reproductive Endocrinology Division, Department of Obstetrics and Gynecology, Georgetown University and Columbia Hospital for Women

Reproductive Endocrinology; Uterine Bleeding Disorders

Leonor Rivera-Calimlim, M.D.

Associate Professor, Department of Pharmacology and Toxicology; Assistant Professor, Department of Medicine, University of Rochester

Drugs in Pregnancy; Drugs in Lactating Mothers

Kenneth B. Roberts, M.D.

Assistant Professor of Pediatrics, Johns Hopkins University; Clinical Assistant Professor of Pediatrics, University of Maryland; Associate Pediatrician-in-Chief, Sinai Hospital of Baltimore

Fluid and Electrolyte Disorders in Infants and Children

William O. Robertson, M.D.

Acting Chairman, Department of Pediatrics, University of Washington; Director, Poison Control Center, Children's Orthopedic Hospital and Medical Center

Poisoning

Beryl J. Rosenstein, M.D.

Associate Professor of Pediatrics, Johns Hopkins University; Director, Cystic Fibrosis Clinic, Johns Hopkins Hospital

Cystic Fibrosis

Harold P. Roth, M.D.

Associate Director for Digestive Diseases and Nutrition, National Institute of Arthritis, Metabolism, and Digestive Diseases

Childhood Peptic Ulcer

Jay P. Sanford, M.D.

Professor of Medicine and Dean, Uniformed Services University of the Health Sciences

Neonatal Pneumonia—Chlamydial; Arbovirus Encephalitis

James W. Sayre, M.D.

Associate Clinical Professor of Pediatrics, University of Rochester

The Infant—Screening Procedures; Common Feeding and Gastrointestinal Problems; Child Abuse and Neglect

Albert P. Scheiner, M.D.

Professor of Pediatrics and Co-Director, Child Development Service, University of Massachusetts

Mental Retardation

Robert H. Schwartz, M.D.

Professor of Pediatrics, University of Rochester; Strong Memorial Hospital

Immunodeficiency Diseases

Ruth W. Schwartz, M.D.

Clinical Associate Professor of Obstetrics and Gynecology, University of Rochester

Gynecologic Practice and Approach to the Patient; Common Gynecologic Problems

Jerome B. Simon, M.D., F.R.C.P. (C)

Associate Professor of Medicine, Queen's University, Kingston, Ontario; Head, Division of Gastroenterology, Kingston General Hospital

Hepatic Disorders in Pregnancy

Charles B. Smith, M.D.

Professor of Medicine, University of Utah, and Chief of Medicine, VA Hospital, Salt Lake City

Infectious Arthritis

James B. Snow, Jr., M.D.

Professor and Chairman, Department of Otorhinolaryngology and Human Communication, University of Pennsylvania

External Ear—Obstructions; External Otitis; Infectious Myringitis; Acute Otitis Media; Secretory Otitis Media; Acute Mastoiditis; Chronic Otitis Media; Congenital Sensorineural Hearing Loss; Nose and Throat—Foreign Bodies; Adenoid Hypertrophy; Pharyngitis; Tonsillitis; Parapharyngeal Abscess; Retropharyngeal Abscess; Velopharyngeal Insufficiency; Juvenile Angioblastomas; Motion Sickness

Sergio Stagno, M.D.

Professor of Pediatrics, University of Alabama in Birmingham

Congenital Rubella; Congenital and Perinatal Cytomegalovirus Infection; Congenital Toxoplasmosis

Richard D. Sweet, M.D.

White Plains, New York

Torsion Dystonia; Spinocerebellar Diseases

Richard C. Talamo, M.D.

Pediatrician-in-Chief, New England Medical Center Hospital

Cystic Fibrosis

Peter E. Tanguay, M.D.

Director, Child Psychiatry Clinical Research Center, University of California Neuropsychiatric Institute

Mental Retardation