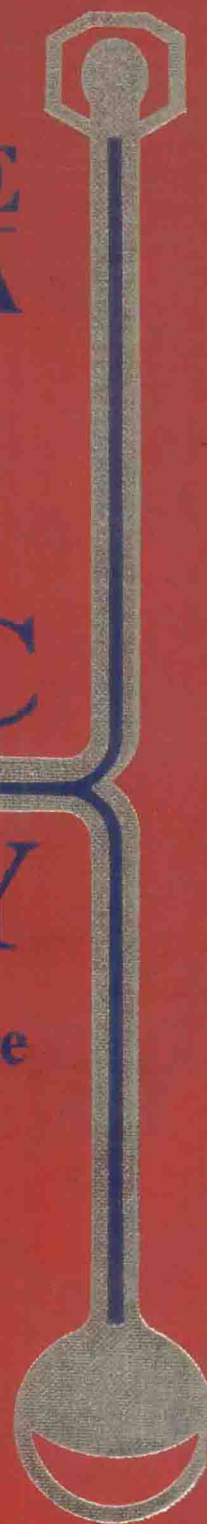


**YAFFE
ARANDA**

**PEDIATRIC
PHARMACOLOGY**

Therapeutic Principles in Practice



SECOND EDITION

PEDIATRIC PHARMACOLOGY

Therapeutic Principles in Practice

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Dedicated to
Anita and Ian
and
Betty, Kenneth, and Christopher
for their unswerving love and support

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Introduction and Historical Perspectives

FOREWORD

to the Second Edition

In ancient times children were regarded as small adults and received little consideration. When the modern era of medical treatment began with the introduction of penicillin in the late 1940s, no thought was given to the correct dosage for infants and children other than to guess and give less. It took a series of therapeutic disasters (1950–1970) to convince people of the uniqueness of infants and children. For years finding the correct dose of a medication for an infant or child was a confusing process. No authoritative source existed until 1979.

This textbook of pediatric pharmacology was “born” in 1979. The second edition has grown and matured dramatically, reflecting the rapid advances in this subject during the past eleven years.

Seventy of the top international authorities in the field have been chosen to write on sixty subjects of major practical interest to all practicing pediatricians. This is clearly the most authoritative text in the field.

This textbook will often be consulted. It contains all of the information you need to know about a drug and how to use it intelligently. It is well organized, clear, comprehensive, and succinct. The editors have done an excellent job in covering this important field and establishing this book as the classic in its field.

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FOREWORD

from the First Edition

During the past decade, pediatric pharmacology has progressed from a subcomponent of adult therapeutics to a well-defined and recognized medical specialty. Clinical misfortunes, such as the chloramphenicol–gray syndrome and the thalidomide–phocomelia tragedies, dramatically increased appreciation of the concept of drug treatment appropriate for age. The concept has also influenced practice with the increasing realization that the child is not a small adult, but rather a growing organism that undergoes continuous changes, at times rapidly, to achieve biological maturity. There was mounting evidence that, to ensure drug safety and efficacy at all periods of human development, from conception to adolescence, increased research was needed to clarify interactions among medications administered, physiologic events, and disease states.

The proliferation of workshops and conferences dealing with some aspect of children and drugs and the allocation of special sections to the subject within the general, pediatric, and pharmacologic publications attest to the concern of pediatricians and pharmacologists within the field of pediatric pharmacology. Interest seems to have reached a peak during the International Year of the Child, 1979, designated by the United Nations to encourage all countries and individuals to rekindle their commitments to children. Two specialized journals were planned during that year, and work started on *Pediatric Pharmacology*, the first textbook devoted exclusively to this issue. This multi-authored book presents chapters covering a broad panorama, from fundamental pharmacologic principles as they apply to developing organisms, to specific clinical advances. The writers, all recognized authorities in their fields, share a common interest in the well-being of children. The editor has achieved a comprehensive overview of the field by including chapters on ethical issues of drug study involving children, the behavioral aspects of compliance, and drug surveillance in this population.

This text will serve as a useful guide to all professionals responsible for the care of children as well as to those treating diseases in pregnant women. The compilation, in a single volume, of existing knowledge in the field of pediatric pharmacology serves one further purpose: because the book permits an evaluation of progress to date and indicates gaps

in knowledge, pediatricians, pharmacologists, and obstetricians may be stimulated through this book to study some new element in pediatric or developmental pharmacology for the benefit of a most important patient—the child.

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PREFACE

Pediatric pharmacology and drug therapy may be viewed as manipulative physiology and biochemistry for the fetus, newborn infant, and growing child. This concept is based on the fact that drugs are used to restore and correct physiological and biochemical abnormalities which occur during pre- and postnatal development.

As advances in the knowledge of diseases and their diagnoses are made, the complexities of treatment, particularly by drugs, increase in tandem. Although therapeutic drug exposure in children has remained relatively constant, the number of drugs available to physicians and health care givers continues to increase. There is an increasing variety of antimicrobials, cardiovascular drugs, diuretics, immunosuppressants, antivirals, and other drugs for the management of sick pediatric patients. Safe and effective use of these agents in infants and children requires adequate knowledge of their pharmacologic properties, including drug action, metabolism, and disposition.

The second edition of *Pediatric Pharmacology: Therapeutic Principles in Practice* has been revised significantly to meet the needs of practitioners in the 1990s. The book has expanded from 24 chapters in the first edition to 52 chapters in this edition, plus an appendix on SI Units and a Drug Formulary appendix. The book is designed to provide relevant information on drugs and their uses in newborn infants, older infants, children, and adolescents. It was proposed as a quick reference for busy clinicians, house staff, students, nurses, pharmacists, and health care providers. It was also written as a general and basic reference for teaching pediatric pharmacology. It is hoped that researchers also will find it useful to understand the unique characteristics and dynamic changes in drug requirements and action during a period of intense growth and development.

The mechanisms of drug actions, the evidence of drug efficacy in certain disease states, dose, therapeutic guidelines, and drug toxicities are emphasized. The book was organized to parallel the distinct periods of early human development. Special sections useful in drug therapy such as therapeutic drug monitoring, adverse drug reactions, and epidemiologic considerations are also included. Certain aspects of pediatric drug therapy, particularly those relating to immunoactive drugs and vitamins, are not included owing to lack of information in these areas. We hope to correct these omissions in the next edition as the knowledge base for these agents in pediatrics increases.

Drugs are double-edged swords; although they can cure illnesses and restore health, they can also produce unwanted and, at times, unanticipated toxicities. The rational, intelligent, and safe use of drugs springs mainly from understanding their actions, uses, problems, and limitations. This understanding in turn will permit selection of the appropriate

drug and prescription of the optimal dosage. It is our utmost desire that this textbook can help those providers of care to children to maximize the benefits of pharmacologic agents while averting their adverse effects. Thus, this book will help in the promotion of health and well-being in children.

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