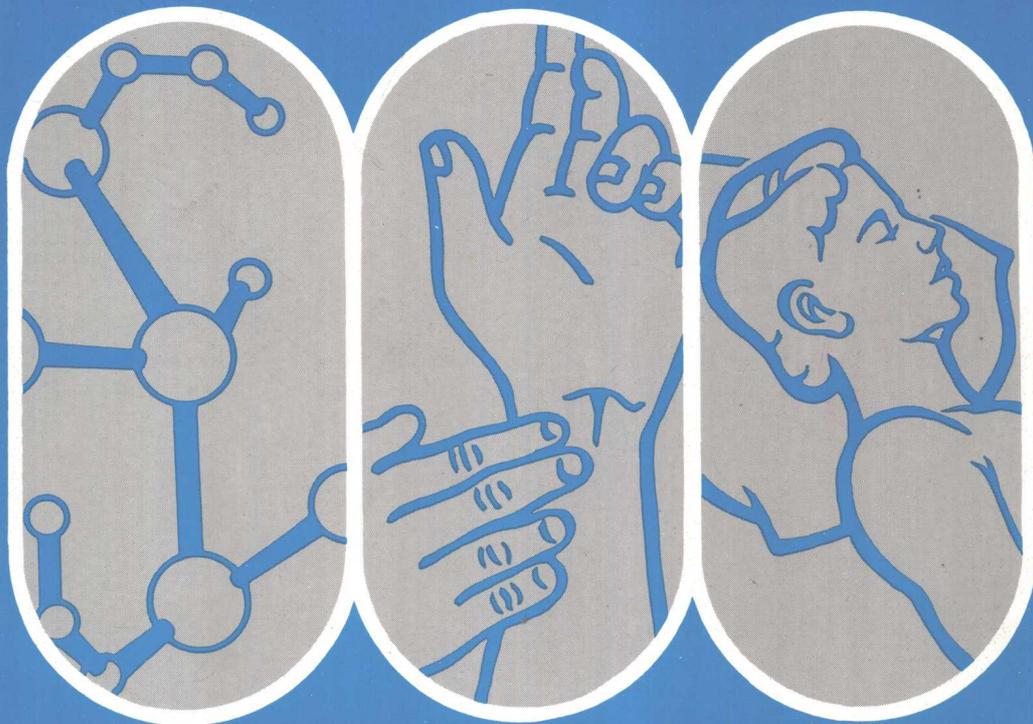


Falconer's

7th Edition

The Drug The Nurse The Patient

Sheridan • Patterson • Gustafson



NEW STUDENT PRINTING - 1985

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The
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In memory of
MARY W. FALCONER
whose foresight, concern and determination
resulted in the development and publication of
THE DRUG, THE NURSE, THE PATIENT.

PREFACE

This book is the result of much thought about the ways and means of making the subject of Pharmacology more meaningful to the student and of bringing into closer contact the formal study of drugs and the actual care of the patient. The authors have attempted to keep the book patient-centered at all times. It would seem unnecessary to emphasize that "drugs are used to treat people—not diseases," but sometimes we become so enthusiastic over the scientific and therapeutic value of drugs for specific conditions that we forget that it is an individual person who is being treated and that, no matter how good a certain drug may usually be, it can be wholly ineffective for the patient under treatment.

In this extensive revision of *The Drug, The Nurse, The Patient*, the patient-centered approach continues to be the primary emphasis. New information has been added and earlier information has been deleted or updated where appropriate.

Part I presents the general nursing knowledge required for the safe administration of drugs. The specific knowledge a nurse must have concerning the patient before administering drugs is discussed. The book also identifies the general information a nurse must have about the drug that is to be administered, the reasoning behind this information, and the resources for it. Recent changes in the drug distribution system are incorporated, as are some of the more obvious effects of these changes on the nurse and the patient.

Relevant data influencing the patient/client response to drugs are included. A review of developmental changes and how these influence the patient's response to illness and drug therapy is presented. The reader is reminded that human development is biological, psychological, and social in nature. Psychological aspects influencing one's drug-taking behavior and responses are also included. We have tried to show how the nurse can incorporate this knowledge in contributing to effective patient care.

Part II of the text continues to focus on clinical pharmacology as it applies to specific conditions. In each chapter the most recently accepted therapies are included, with special emphasis on the effects on the patient and related nursing care and nursing implications. Only those drugs approved by the Food and Drug Administration for distribution in the United States at the time of writing have been included. The authors realize that drugs now being used on an experimental basis may possibly be approved for distribution in the near future but there is always the possibility that they may not. It is for this reason that we chose not to include these drugs.

The reader will note major changes in Part II of the text, Clinical Pharmacology. A conceptual approach is used to demonstrate how drugs influence neural and hormonal integration, the transportation of body fluids, electrolytes and gases, and nutrition and elimination, as well as their use in the prevention and control of infection and the treatment of neoplasms. A separate section is assigned to a miscellaneous group of preparations not so classified.

A greater emphasis has been given to the use of overviews and tables to summarize pertinent information.

The authors are especially thankful for the assistance of the many who have helped to bring this revision to completion. A special thank you to our students, reviewers, and peers, who have offered constructive recommendations for this revision. The patience of our families and the assistance of Katherine Pitcoff, Nursing Editor at W. B. Saunders, is most gratefully appreciated.

ELEANOR SHERIDAN
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SUGGESTIONS FOR USE OF THE BOOK FOR BOTH FACULTY AND STUDENTS

The Drug, The Nurse, The Patient is, as described in the preface, a patient-centered text. In addition, all the major drugs that nurses are usually called upon to administer have been collected for reference in the *Current Drug Handbook* (available as a separate paperback). This combination will be used throughout the student's entire preclinical and clinical experiences, as well as retaining it as a reference after graduation.

This book is divided into two parts:

I. Introductory material, which includes information basic to all clinical situations where drugs are used as part of therapy. This includes specific information applicable to drugs in general, their development, control, actions and interactions; nursing responsibilities as to drug administration and/or supervision; patient and client data that influence responses to drugs and drug-taking behavior.

II. Clinical pharmacology, which includes information about specific drug classifications. This section is planned for use in conjunction with the various clinical experiences of the student as well as an easy reference for practitioners. A conceptual approach is used to show how drugs influence neural and hormonal integration; the transportation of body fluids, electrolytes, and gases; nutrition, and elimination, as well as their use in prevention and control of infection and the treatment of neoplasms. A separate section is assigned to a miscellaneous group of drugs that could not be easily classified.

The first part of the book does not deviate markedly from a standard pharmacology textbook, though the authors have tried to eliminate nonessential details in order to make this area more interesting to the student.

The mathematics of pharmacology is covered in a separate chapter and has been kept as simple as was consistent with the material involved. Only those areas relevant to drug administration have been included. Any student deficient in basic arithmetic skills may want to refer to a programmed text on the subject. A listing of these references is included in the bibliography for that chapter. If this is not helpful, a remedial course in mathematics may be necessary. The number of practice and review problems is small. Some additional problems have been added at the end of various clinical chapters. Calculation of dosage is becoming less and less the nurse's responsibility. However, when it is required, it must be done accurately.

The second part of the book is planned for use in conjunction with the various clinical experiences of the student. There are chapters discussing drugs used in specific as well as general clinical areas. A regular chapter format has been used in the development of this part of the text, varying only as needed to suit the different materials presented. At the beginning of each chapter there is a list of basic scientific information important to the understanding of the material in the body of that chapter. These are very brief, but the student should study (from an appropriate reference source) any that are not fully understood. A somewhat arbitrary coding has been used to secure uniformity. The sciences have been numbered with Roman numerals as follows:

- I. Anatomy and Physiology
- II. Chemistry
- III. Microbiology
- IV. Physics
- V. Psychology
- VI. Sociology

The subheadings have been given Arabic numerals, thus 1, 2, 3, and so on. This plan has been followed even though, in some cases, a heading has only one subheading. References have been placed at appropriate places in the body of the chapters, thus, I-3, V-1, III-4, etc. It is expected that the student will refer back to the beginning of the chapter for help in understanding the subject matter presented. Naturally, some chapters will need far more basic scientific background than others and, in some cases, there will be only one or at most two sciences used as reference.

The body of each chapter in which clinical material is included contains, first, a brief discussion of the typical clinical picture, with the predominant symptoms as they are usually encountered. Following this is a consideration of which drugs are used to alleviate these symptoms or to cure the condition, how they are administered, and what action is likely to take place. Only information about drugs directly pertinent to the proper care of the patient is given. If further information is desired, the student is expected to refer to the last section of the book or to other appropriate references.

The following outline has been maintained throughout the clinical section, varying, as mentioned before, according to change in subject material.

- Definition (of the disease or condition, usually with a brief discussion of it)
- Major Symptoms
- Drug Therapy
 - The Drug
 - The Nurse
 - The Patient

The basic divisions have been further subdivided as follows:

The Drug. Here is a brief statement as to source, historical significance of the drug or any other pertinent fact not covered in the other areas.

Physical and Chemical Properties A very brief coverage of the physical and chemical properties of the drug under consideration, especially those that are of significance to the nurse.

Action This covers the action of the drug in the body insofar as this is known.

Therapeutic Uses Conditions for which the drug is used.

Pharmacokinetics How the drug enters the body, its fate within the body, how, where and in what form it is excreted. Again, this insofar as it is known.

Preparations and Dosages Various preparations of the drug, how given, the average dose, and usually how often it is administered. In this area are included the generic and major trade names, both of the United States and Canada. The letter designation is also given, such as U.S.P. and B.P.

Side Effects Effects to be expected from this drug other than those for which it is given. What, if anything, can and should be done about them.

Toxicity and Treatment If the side effects are all undesirable, this heading may merge with the one above. However, usually serious toxic symptoms and their treatment are discussed here.

Interactions Effect this drug has on other drugs given at or about the same time, and also their action on the drug being discussed. Drug effects on laboratory tests is also included.

Contraindications Contraindications are given if there are any.

The Nurse. This section includes nursing actions to assist the patient/client in achieving maximum benefits from drug therapy. Recommended nursing actions include those for maximizing therapeutic effects and those for minimizing adverse effects; special administration precautions (such as preparation, timing, administration precautions, palatability, etc.); monitoring of patient response to therapy; legal aspects; and storage.

Information that the patient/client or family should know about the drug is also given in this section. This is especially important when the drug is to be taken without direct medical or nursing supervision.

The Patient. Under this heading is considered the psychologic, emotional, social, economic, and spiritual aspects of the particular drug and/or disease being discussed. Some phases of patient teaching may be included here. In some instances the material under this heading may be applicable to several drugs. When this is the case, the information is given only once to avoid repetition. There are cross-references to cover this contingency.

At the end of each chapter the authors have included a section labeled "It is Important to Remember." Very briefly, this gives some of the more important facts brought out in the chapter, especially facts that are somewhat contrary to the layman's belief. Lastly, there is a section marked "Topics for Study and Discussion." It is hoped that these will serve to stimulate the student to further investigation of drugs and their place in helping people to "get well" and to "keep well." Among these topics will be found problems that the student may encounter in giving the drugs, discussed in the body of the chapter. The authors feel that even though the subject of the mathematics of drugs may be covered early in the nursing program, it is well to refresh the memory with up-to-date problems. Many instructors ask this type of question at each class as a teaching aid.

An updated bibliography is also included at the end of each chapter. The listed resources reflect references used in the development of the chapter and may offer additional information for those who may be so interested.

THE AUTHORS

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1

Introduction

I

The Drugs

The Development of Pharmacology

General Information About Drugs

Actions and Interactions of Drugs in the Body

1

THE DEVELOPMENT OF PHARMACOLOGY

Fire properly controlled can be our best friend — uncontrolled, it is our worst enemy. This same statement might well be applied to drugs. Properly used, drugs are a great blessing; indiscriminately or improperly used, they could destroy the race.

The nurse will find the study of drugs a fascinating pursuit. There is real romance in the origin of many medicines, and a real thrill in the dramatic recoveries some drugs produce. However, as with most important subjects, the study of pharmacology is accompanied by many less interesting details. The student must be able to see the final goal — the lessening of human suffering — to appreciate the need for understanding these seemingly minor points. It is the fact that most drugs can kill as well as cure that makes the full understanding of all the details essential.

The history of pharmacology is as old as the story of mankind. We have always experienced sickness and injury and have searched for means of combating disease and caring for the wounded. This search for therapeutic measures marks the progress of civilization.

The earliest medicinal remedies were the result of several divergent factors. One was observation of the activities of animals, both wild and those early domesticated. By watching these animals, the therapeutic properties of various plants, waters and muds were realized. Most primitive peoples believed that the world was filled with invisible spirits which were either good or bad. Disease was the manifestation of the evil spirit. Therefore, to cure disease it was essential to "drive out" these spirits by giving the person who was ill all sorts of noxious materials. The experimentation with these substances led to the beginning of medicine, for some of the "medicines" actually did help the patients to recover. Combining the information gained from these, and no doubt other sources, with personal observations of the effects of certain herbs, other plants, and animal products, led early humans to the discovery of the real value of many substances used in medicine

today. Savages in widely separated areas knew the effects of certain poisons such as curare, veratrine, ouabain and nux vomica. They used these poisons on their arrows and spear tips to paralyze or kill the victim, animal or human. Curare, which causes temporary paralysis, was used mainly for hunting, as the agent did not affect persons eating the meat of animals on which it had been used. Today curare is used as a skeletal muscle relaxant. Veratrine, ouabain and nux vomica usually killed, and in the latter case the meat was apt to be poisonous. Strychnine is obtained from nux vomica. It is a strong muscle stimulant causing convulsions in large doses. It is not in common use now since other less toxic drugs are available. Veratrine derivatives are now used to reduce high blood pressure, and ouabain is used in the treatment of certain forms of heart disease.

Primitives also knew of the beneficial effects of many drugs which are still used. Probably the most important of these was the latex (milk) of the capsule of the poppy — opium — which is still used to relieve pain.

PRE-CHRISTIAN MEDICINE

Egyptian

Some of the oldest written records of drugs are the Egyptian papyri, the most important of which is the Ebers papyrus written about the sixteenth century B.C. This is a scroll over 20 yards long which contains clinical reports, a collection of prescriptions and formulas covering a wide range of materials. Many of the recipes include drugs that are still in use. Among these are castor oil, wormwood, aloe, peppermint, opium and henbane. Minerals and metals used by the Egyptians were iron, copper sulfate, magnesia, niter, sodium carbonate, sodium chloride and precious stones finely pulverized. The animal products included such extraordinary substances as lizard's blood, swine's teeth, asses' hoofs, goose grease, animal fat and animal excre-