DRUGS AND THE PHARMACEUTICAL SCIENCES VOLUME 15

# Pharmacokinetics

Second Edition
Revised and Expanded

Milo Gibaldi
Donald Perrier

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# Pharmacokinetics

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# Pharmacokinetics

SECOND EDITION, REVISED AND EXPANDED

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# Preface

Pharmacokinetics is the study of the time course of drug absorption, distribution, metabolism, and excretion. It also concerns the relationship of these processes to the intensity and time course of pharmacologic (therapeutic and toxicologic) effects of drugs and chemicals. Pharmacokinetics is a quantitative study that requires a preexisting competence in mathematics at least through calculus. It is also a biologic study and can be very useful to the biomedical scientist.

At a fundamental level, pharmacokinetics is a tool to optimize the design of biological experiments with drugs and chemicals. All biologists would benefit from some knowledge of pharmacokinetics whenever they engage in data analysis. It has become increasingly important in the design and development of new drugs and in the reassessment of old drugs. Clinical applications of pharmacokinetics have resulted in improvements in drug utilization and direct benefits to patients.

There is consensus that the origin of pharmacokinetics can be traced to two papers entitled "Kinetics of distribution of substances administered to the body" written by Torsten Teorell and published in the *International Archives of Pharmacodynamics* in 1937. Since this unheralded beginning, the study of pharmacokinetics has matured rapidly; undoubtedly growth has been stimulated by major breakthroughs in analytical chemistry, which permit us to quantitatively detect minute concentrations of drugs and chemicals in exceedingly small volumes of biological fluids, in data processing, and by the brilliant insights of many scientists. Dost, Kruger-Theimer, Nelson, Wagner, Riegelman, and Levy are among those scientists and must be reserved a special place in the history of the development of pharmacokinetics.

Our goals in preparing this revision were similar to those that prompted us to undertake the initial effort. The need for revision was amply clear to us each time we looked at our files, bulging with research papers and commentaries on pharmacokinetic methods and

applications published since 1975. The buzz words today are clearance concepts, noncompartmental models, and physiologic pharmacokinetics. Again, we strived to present the material in an explicit and detailed manner. We continue to believe that *Pharmacokinetics* can be used in formal courses, for self-study, or for reference purposes.

We thank our colleagues for their work and publications, our staffs for their labors and support, and our families for their love and understanding.

Milo Gibaldi
Donald Perrier

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