BOOK REVIEWS

FREEMAN AND JOHNSON'S CLINICAL RADIONUCLIDE IMAGING, Vol. I and II. L. M. Freeman, Ed. New York, Grune and Stratton, Inc., 1984, 1528 pp, $179.00

The Third Edition of *Freeman and Johnson's Clinical Radionuclide Imaging* has evolved from its original design as a book oriented predominantly toward a discussion of nuclear medicine imaging to one that has become an excellent textbook of medical diagnosis, providing basic factual information and the clinical correlations that support the radionuclide technique. This change in the approach somewhat parallels the progressive change in the thrust of nuclear medicine. In contrast to many edited books with chapters by different authors, the uniformity of quality and the minimal overlap of information in the various chapters emphasizes the attention expended by those responsible for assembling the final product. The contributors represent an outstanding cross section of clinicians and scientists in the field. In many chapters the extensive treatment of the subject illustrates clearly the magnitude of the effort put forth by the authors.

The content thoroughly covers both the basic and clinical science aspects. The subject matter is up-to-date in that outmoded techniques such as pancreatic and placental studies have been omitted, whereas areas of recent rapid development, such as instrumentation, computer applications, cardiology, hepatobiliary studies and positron imaging, are prominently presented. The division of the large topics, such as cardiology, central nervous system, and liver and biliary tract into "stand alone" sections provides comprehensive information on the particular subject with the advantage of ready reference to a specific area. An attractive aspect of this work is the inclusion of worthwhile topics not usually found in general texts, e.g., the practical considerations for handling pediatric patients. As in any broad work, there are a number of areas that do not warrant an independent chapter yet merit discussion. The chapter on miscellaneous applications contains ten important individual topics, again subdivided for reference. The chapters include extensive bibliographies, most from recent publications, which should be very helpful to investigators and practitioners. At the end of the second volume there is an excellent glossary and 11 tables that provide in an organized format a ready reference to various aspects of radioactive tracers from very basic information to a list of those approved for human use. The major shortcoming is the paucity of images obtained by single photon emission tomography.

This two-volume set will serve well as a reference source for those associated with the practice of nuclear medicine, as a basic resource for clinicians in other fields, and as a necessary text for physicians in training. Most importantly, this work fills a void in the nuclear medicine literature.

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THE 1984 YEARBOOK OF NUCLEAR MEDICINE. P. B. Hoffer, A. Gottschalk, B. L. Zaret. Chicago, Year Book Medical Publishers, Inc., 1984, 402 pp, $42.95

This yearly landmark for nuclear medicine is clearly a service to the profession. It covers 61 different journals, including all of the familiar ones plus many not so familiar (such as the *American Journal of Sports Medicine*, *Nuclearmedizin*, and the *Australian Pediatric Journal*), and represents literature reviewed up to July, 1983. The book's dimensions have increased in size, but the number of pages remains the same. As usual, the contents are well arranged, and there is both a subject and author index. The present editors have done a superb job as they have done for the past 4 yr. Like last year, they have included a Memorial Essay dedicated to the late, former editor, James L. Quinn III. This essay covers cerebral perfusion imaging, including emission tomography with radiolabeled amines, and it is especially well done.

I must confess that I have bought these books every year but never read them in any systematic manner. A reviewer, however, must be thorough, and it is rewarding, especially when a book is as excellent as this one. It is well worth your time, and you may wonder how much you have missed in the past. As usual, the frequent editorial comments are stimulating and valuable, and the editors show their interest in integrating imaging modalities in the workup of the patient. There are judgments here that you expect in textbooks, but rarely find in current literature. For example, the problem encountered with the patient on a prolonged oral fast or on narcotics, and who then has a hepatobiliary study are discussed; and in another section there is a note: "we admit we're slow but we're beginning to get the idea that the perfusion-blood pool mismatch is pathognomonic of hemangiomas regardless of whether they appear in the liver or elsewhere." It also can be discouraging to learn from the experts that the diagnosis of osteomyelitis in a diabetic foot remains a difficult problem and that the "hot patella" sign does not appear to have any diagnostic value. Numerous other cogent observations will provoke interest and study. This book awaits your time and pleasure and will reward both.

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ANIMAL MODELS IN RADIOTRACER DESIGN. R. M. Lambrecht, W. C. Eckelman, Eds. New York, Springer-Verlag, 1984, 234 pp, $32.50

In the preface it is stated that this book is the product of two workshops sponsored by the Radiopharmaceutical Science Council of the Society of Nuclear Medicine held in conjunction with the Society meetings in January and June of 1982. To the reviewer, however, it seems that this book is much more than a collection of papers and data from these two meetings—it is a well-organized and well-written presentation containing over one thousand references in seven chapters. Each chapter covers a different area of radiopharmaceutical research, and for this reason it is important to discuss each chapter individually.

The chapter on animal models in biomedical research is general in nature with discussions of the problems of selection of animal models from the viewpoint of radiopharmaceutical science and nuclear medicine. Listed are 190 selected animal models for specific human diseases and the references for each model. Also, there is a compilation of models for 48 different disease topics with appropriate references. These two listings do not duplicate the models described in the other six chapters on specific subjects. In addition, this chapter includes guidelines for research with animals.

The research reported in "The Development of Radiotracers

that are Substrates for (catecholamine) Uptake$_1$ and Uptake$_2$" is concerned primarily with the mechanisms involved in the uptake of catecholamines by various tissues and the species differences associated with uptake$_1$ and uptake$_2$. This review also covers other compounds that participate in uptake$_1$ and uptake$_2$, and there is a discussion of the adrenal medulla and other extraneuronal uptake. Also the role of possible pathological changes in uptake$_1$ and future directions of research in this area are described. In the chapter on monoclonal antibody applications, the requirements for the receptor antigen and the carrier antibody, tumor model systems, and the nude mouse are presented competently, with additional comment on many of the potential pitfalls in monoclonal antibody research. Recommendations for future use of monoclonal antibodies with their evaluation in vitro and in vivo are given. "Small Animal Oncological Models for Screening Diagnostic Radiotracers" discusses the need for tumor models and provides information on the classification, growth, and spread of neoplasms. Guidelines are given for the selection of tumor models in general as well as for tumor models based on the mechanism of uptake of radiotracers. Included is a literature review from 1976 through 1981 with more than two hundred references to tumor models, their hosts, and the radiotracers used. The chapter on radiolabeled platelets is a specific review in relation to the use of radiotracers, concentrating on work with In-111 labeled platelets. Work in animal models of atherosclerosis, coronary artery thrombosis, and vascular grafts using dual-isotope subtraction technique is explained. In the presentation on hepatobiliary radiotracers, the authors comment on the advantages and disadvantages of animal models used for hepatobiliary studies and cover anatomical and pharmacokinetic species differences. Variables that must be considered are the anesthetic used, the temperature maintained during the study, surgical techniques, and the ages of the animal model. Studies of the perfused liver, isolated hepatocyte uptake studies, and models of hepatobiliary disease are discussed. In the chapter on renal radiodiagnostic agents animal models that have been used with different radiotracers and their relationship to studies in man are evaluated. Several solutions are given for differences due to different circulation times and body size and methods are provided to produce models that simulate renal diseases in man.

It would be difficult for the reviewer to adequately praise this book. It contains a vast number of references and detailed tables. Although designed for those in radiopharmaceutical research, the subject matter would be extremely valuable to any researcher developing compounds to be used in the study or treatment of human diseases. In the foreword it is suggested that this book is a "must" for anyone new in the field. I further suggest that this book is a "must" for all those in radiopharmaceutical research, because it brings together an abundance of ideas and information on animal models and radiotracers from some of the most knowledgable people in this area of scientific activity.

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NUCLEAR MEDICINE—FACTORS INFLUENCING THE CHOICE AND USE OF RADIONUCLIDES IN DIAGNOSIS AND THERAPY. National Council on Radiation Protection and Measurements, Bethesda, NCRP Publications, 1982, 180 pp, $12.00

This little book probably should be on the "best-seller list" of nuclear medicine publications, for the title underestimates its content. It might better be referred to as a "Handbook of Nuclear Medicine As a Basic and Clinical Science."

The book is especially comprehensive in scope with regard to the basic science aspects of nuclear medicine, and leads the reader to a wellspring of reference materials. Particularly helpful are appendices containing guidelines for radioactive drug product development as well as the extensive tabular appendix giving the factors of radiation dose for most radioactive drug products. (This latter term "radiopharmaceutical drug products" (RDPs) is extensively used instead of the term "radiopharmaceuticals.") Despite the complexity of some of the topics treated, they are presented in a very agreeable form. Furthermore, the monograph integrates the many excellent NCRP documents related to nuclear medicine that have been produced over the years and probably are not as frequently referred to as they should be. A list of such documents in the first chapter makes this much easier to accomplish than previously. Six chapters are devoted to a logical sequence of consideration of those factors leading to the establishment and performance of clinical nuclear medicine procedures.

Chapter 1 is distinctive, especially for its references to related NCRP documents; however, the title may be somewhat confusing. Perhaps the authors took some liberties with the term "decision making," which, today, is more specifically reserved for the actual analysis of individual procedures with regard to their efficacy and efficiency in patient management. The authors use the term here much more broadly, however, and discuss the general concept of analysis of factors leading to a useful application of RDPs. The very short first chapter sets the stage for the subsequent chapters. In Chapter 2, again, this same extremely liberal use of the term "decision making" is applied to the analysis of factors involved in the production and use of RDPs. In general, the chapter emphasizes many considerations not often sufficiently recognized by nuclear medicine personnel. A few suggestions, such as using cathartics to eliminate RDPs from the bowel, seem to be a bit impractical, as is the extensive discussion of "harm" from misadministration of RDPs without making the distinction between diagnostic and therapeutic uses. Chapter 3, dealing with instrumentation, is an excellent overview with the occasional fault of its being sketchy, since the authors have tried to be too comprehensive. Valuable information on radiation dosimetry is provided in Chapter 4. As a result of the multiple authorship, certain terms in this chapter, as well as in others, are not sufficiently defined, and such items as computer notation are used, which may not be readily recognized by those who have not had experience in programming. There is an excellent and pertinent discussion of radiobiology, especially as related to those RDPs that are used for therapeutic purposes. One reference with regard to radiation pneumonitis being produced in the lungs from radioactive iodine, however, may no longer be accurate in view of more recent experience with radioiodine therapy in thyroid carcinoma metastatic to the lungs. Also, the discussion on the utilization of P-32 for polycythemia varia does not reference more recent data, indicating that leukemia occurs more frequently with treatment by chemotherapy than with P-32. Overall this chapter presents a great deal of useful material succinctly, and Appendix B supplements this section. Chapter 5, dealing with evaluation of radionuclide procedures and their clinical utility, probably is *the* chapter that best presents decision making in nuclear medicine. Indeed, it lays an excellent groundwork for putting nuclear medicine procedures into proper clinical perspective. The last chapter covers some practical guidelines for implementing the factors that influence the use of nuclear medicine procedures.

Thus, this text joins the many other excellent, useful publications produced by the NCRP over the years as an excellent reference. It certainly should be on the bookshelf of every nuclear medicine physician for ready reference and is a "must" reading assignment for all nuclear medicine residents in training and, probably, radiology residents as well.

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