

JNMT Bookshelf

CARDIAC NUCLEAR MEDICINE

B.L. Holman, H.L. Abrams, E. Zeitler, eds., Springer-Verlag, New York, 1980, 88 pp, \$19.00

This monograph comprises number 3 (Volume 2) of the Springer journal *Cardiovascular Radiology*. The monograph is a state-of-the-art survey of radionuclide techniques used in the diagnosis of cardiac disease. Well suited for the physician, the articles cover first-pass angiocardigraphy, gated ventriculography, myocardial scintigraphy with infarct-avid tracers, quantitative assessment of thallium-201 images, Tl-201 myocardial perfusion scintigraphy during rest and exercise, assessment of regional myocardial blood flow using the inert gas wash-out technique, and emission tomography of the heart. The references for each article are extensive and the quality of image reproduction is excellent. This text would be an asset to any nuclear medicine departmental library.

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HUMAN ANATOMY AND PHYSIOLOGY

Alvin Silverstein, John Wiley & Sons, New York, 1980, 887 pp, \$24.95.

The author, who is chairman of a college biological sciences department, presents a very detailed textbook that is punctuated by fine illustrations. In 39 chapters he explores the areas of development, nutrition, disease and body defenses, biomedical frontiers, and societal impact on health sciences. Review questions follow each chapter.

Diagnosis of disease is touched lightly, with little information directly relating to nuclear medicine. A section titled "Tests of Thyroid Function" shows a poor scan and mentions BMRs and PBIs. One must also cheerfully ignore a comment found in the "Biomedical Frontiers" section which states that "the CAT-scanner can successfully replace other, potentially more dangerous or less accurate diagnostic techniques, such as . . . radionuclide scanning."

This reasonably-priced textbook would be an appropriate addition to the library of a nuclear medicine technology training program. Occasional typographical errors do not mar the otherwise understandable prose.

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RADIOPHARMACEUTICALS II: PROCEEDINGS OF THE SECOND INTERNATIONAL SYMPOSIUM ON RADIO-PHARMACEUTICALS

Society of Nuclear Medicine, New York, 867 pp, \$40.00

This book is a compilation of papers presented at the Second International Symposium on Radiopharmaceuticals. A wide breadth of subject matter is covered beginning with international regulatory affairs relating to radiopharmaceuticals. This section opens with a keynote address by Governor Dixie Lee Ray, former AEC chairman, speaking on "Potential Uses of Atomic Energy in Light of Increased Government Regulations." Other papers include a description of the USFDA system for classifying and approving New Drug Applications for radiopharmaceuticals, the regulation of radiopharmaceuticals in Canada, and a U.S. manufacturer's viewpoint on regulations.

The remainder of the book is divided into specialized subject areas introduced by a review article written by an expert in the field and followed by scientific papers on the subject. These areas include quality control in the hospital, organic radiopharmaceuticals, inorganic radiopharmaceuticals, oncology, hematology, pharmacokinetics, cardiopulmonary, RES/biliary and skeletal system agents, pancreas, prostate and adrenal agents, and radionuclide production. Subject areas not followed by scientific papers include functional imaging, the central nervous system, radioimmunoassay, kidney, and thyroid.

Review articles are well written and up-to-date.

K. Kristensen covers quality assurance of radiopharmaceuticals, describes the procedures followed by Isotope Pharmacy in Denmark, and discusses the results of an extensive compliance study of Tc-99m labeled kits. He concludes with suggestions for a hospital quality control program for radiopharmaceuticals.

A.P. Wolf presents a practical approach in updating since 1975, the trends and directions in design and preparation of organic radiopharmaceuticals labeled with positron emitters with particular attention given to nuclide production, specialized technology, and the problems encountered with the need for carrier-free materials.

E. Deutch presents a very clear description of the chemistries of gallium and technetium radiopharmaceuticals with consideration of their periodic relationships. Also discussed are factors such as competitive equilibria and kinetic and thermodynamic parameters influencing bio-distribution of gallium agents as well as the techniques of single crystal x-ray analysis, electrochemistry, and
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HPLC used to characterize technetium agents.

H.L. Atkins discusses clinical needs in functional imaging with consideration of radionuclide selection based upon a figure of merit determined for several radionuclides, including single photon emitters and positron emitters obtained from accelerators or generator systems.

M. Welch discusses radiopharmaceuticals labeled primarily with positron emitters developed to measure several neurological parameters including blood volume, brain tissue composition, blood flow, brain metabolism, brain receptor concentrations, and interaction of platelets with vessel walls.

R. Ekins presents a comprehensive discussion of radioassay techniques describing the general principles and theoretical and practical considerations of the "reagent excess" and "limited reagent" methods of radioassay. The relative merits of isotopic and non-isotopic labels are discussed in addition to future development trends.

G. Ege updates radionuclide lymphoscintigraphy reviewing historical development, characteristics of the ideal agent, techniques of injection and imaging particularly for internal mammary lymphoscintigraphy, radiation dosimetry, instrumentation, and clinical application.

M. Thakur looks at the role of radiopharmaceuticals in nuclear hematology reviewing ideal radiotracer properties and cell labels (cohort and random labels) with particular emphasis on In-111 oxine considering the cell labeling mechanism, cell toxicity, and in vivo applications.

R. Notari introduces the section on pharmacokinetics with an overview of its origin, its definition and the kinds of questions pharmacokinetic studies try to answer, emphasizing improvement in product evaluation and design, clinical therapy, and drug design.

H.S. Winchell discusses radiopharmaceuticals for kidney evaluation with a clear and concise explanation of renal excretory physiology, the chemical nature of substances excreted or retained by the kidney, giving examples of specific radiotracers used and the clinical information gained through their use.

G. Pohost reviews the clinical utility of myocardial perfusion imaging with Tl-201 chloride. He discusses the physiologic basis for its use and technique of imaging considering spatial resolution with the gamma camera and its clinical application in exercise studies and studies at rest used to demonstrate ischemia and myocardial infarct or scar.

M. Loberg presents an extensive review and the current status of hepatobiliary imaging agents beginning

with hepatobiliary anatomy and physiology followed by a discussion of disease factors that influence the design of new agents. Also included is a comparison of the synthesis, pharmacokinetics, and structure-distribution relationships of existing Tc-99m hepatobiliary agents and their clinical application in evaluating hepatobiliary disease. A final note covers future trends in tracer design.

M. Francis discusses skeletal imaging agents and bone composition citing those studies confirming the site of localization of the diphosphonate moiety, found principally in inorganic material of bone and primarily associated with amorphous calcium phosphate. Studies are presented that provide some understanding of the mechanism by which various ligands react with bone as well as a discussion of possible mechanisms of deposition of Tc-99m skeletal imaging agents in bone. A comparison of HEDP, MDP, and HMDP is made in these studies.

H. Nishiyama reviews radiopharmaceuticals for thyroid imaging, which include Tc-99m pertechnetate, radioiodide, Cs-131 chloride, Tl-201 chloride, Ga-67 citrate and Se-75 selenomethionine. Special emphasis is given to evaluation of cold nodules and methods used to differentiate between nodules of benign and malignant nature using radiopharmaceutical and fluorescent imaging techniques. Physiologic consideration in the use of radioiodide and technetium is given as well as discordant scintigraphic findings from their use. Numerous literature studies are cited and summarized in tabular form.

M. Blau examines the current state of the art in radiopharmaceuticals for pancreas, prostate, and adrenal imaging. The discussion covers the development of these organ localizing agents based upon metabolic, hormonal, and pharmacologic activity.

D. Silvester covers the topic of radionuclide production—the final review article in the text. An overview of current production programs is given, some new innovations in radionuclide production are covered, and considerations in choosing a cyclotron are discussed. An extensive table is presented listing the commercial and non-commercial accelerator programs—which includes their location and firm name, machine type, and radionuclides routinely produced. Another table lists the cyclotrons available from major manufacturers along with their basic specifications.

This book provides very informative reading and will be of most benefit to nuclear medicine physicians and scientists.

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