

BOOK REVIEWS

NUCLEAR MEDICINE ANNUAL 1983. L. M. Freeman, Ed. New York, Raven Press, 1983, 408 pp, \$39.50

As years go by I purchase fewer medical textbooks and rely more on journals as a source of current information. My reason for this is that by the time books come to press, they are already dated—this criticism, however, cannot be directed at the 1983 *Nuclear Medicine Annual*.

The format follows that of previous volumes. There are nine chapters, covering a wide spectrum of current nuclear medicine practice. Each chapter stands on its own, and the list of authors is a mini "Who's Who" of the field.

In general, the style of writing is even and easy to read, and the quality of print and images is excellent. I particularly liked the chapters, "Radionuclide Evaluation of Joint Disease," by Lull and colleagues and "The Use of Radioiodine in the Management of Thyroid Cancer," by Hurley and Becker. These chapters, just as all the others, are exceedingly well referenced and contain important clinical information not easily obtained from a single source.

Dr. Graham's article, "Clinical Applicable Modifications of Anger Camera Technology," is excellent and provides valuable information for those in the market for a new instrument.

Although the chapter on the role of nuclear medicine in non-coronary heart disease is an excellent review, I felt that additional technical details would have been helpful, e.g., how best to subtract background or find the correct position of the edge of the ventricles. If the interobserver variation in determining ejection fraction is 5%, how can we use 5% as a significant change?

The chapter on nuclear magnetic resonance imaging is less well organized, and the explanation of the physics requires some prior understanding of basic principles and terminology. Not all would agree that the abbreviations used are standard in the literature. The title of the chapter indicates it will cover the interrelationship with radionuclide imaging, but although there is a discussion of microwave imaging, real-time ultrasound, and digital angiography, the interrelationship with nuclear medicine is largely limited to that with emission tomography.

Thrall and Swanson wrote the chapter, "Interventional Aspects of Nuclear Medicine," which includes a discussion of a conglomerate of studies—testing thyroid function with TSH and TRH; determining adrenal function by dexamethasone suppression; analyzing heart function with exercise thallium and gated-angiographic studies; evaluating kidney function with diuresis renography; and detailing procedures on the gut, including gastrointestinal reflux, bleeding, hepatobiliary imaging including the response to cholecystikinin. Clearly, these are unrelated topics, and although the authors are recognized authorities the overall format of the chapter seems somewhat contrived. In addition, there is overlap in this chapter with the one on gastrointestinal imaging by Chaudhuri and Chaudhuri.

Larson and Carrasquillo have provided a very valuable chapter on nuclear oncology, and their up-to-date information on radiolabeled monoclonal antibodies against a melanoma antigen gives some hope that this form of treatment might well have efficacy.

The final chapter by Holman and colleagues deals with radiolabeled compounds (in particular [¹²³I]iodoamphetamine) for functional brain imaging.

Who should buy and who should read this book? A copy should be available in every nuclear medicine laboratory, and I believe all nuclear medicine residents will find it valuable, both for clinical practice and for obtaining factual information necessary to satisfy examination requirements. Nuclear medicine consultants will find most chapters very enlightening. Even those who consider themselves expert in specific areas, will find this book provides some new information and references.

Freeman and Weissmann are to be congratulated on this work. We hope the series will continue to present up-to-date information on a wide variety of nuclear medicine procedures straight from the pens of authorities.

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COMPUTED TOMOGRAPHY IN RADIATION THERAPY. C. C. Ling, C. C. Rogers, and R. J. Morton, Eds. New York, Raven Press, 1983, 284 pp, \$45.00

This volume is based on material presented at the symposium, "Computed Tomography in Radiotherapy," (September 18-19, 1981, Arlington, Virginia) sponsored by the American Association of Physicists in Medicine. The collection of papers presents an excellent review of the state of the art technology in the use of transmission computerized tomography (TCT) in radiotherapy.

The volume is divided into three primary sections; use of TCT in clinical radiotherapy, in radiotherapy treatment planning, and in clinical dosimetry. Anatomical regions and specific tumor sites for CT applications in radiotherapy are discussed in the first section. For each anatomic area and tumor site, attention is given to special considerations and precautions necessary in the evaluation of diagnostic TCT scans compared with therapy TCT scans. The anticipated benefits and impact of TCT on tumor localization and normal tissue delineation on radiotherapy treatment results are discussed. Of special note in this section of TCT and radiotherapy is the chapter devoted to the value of TCT in brachytherapy applications. Illustrations include a gynecological implant with standard tandem and ovoids, an Ir-192 implant of the breast, and an I-125 permanent implant of the prostate. For each presentation, the usefulness of TCT for the determination of normal and tumor tissue localization and for spatial identification of radioactive seeds and sources is illustrated.

The second section provides information necessary for the use of TCT in treatment planning: an introduction to the physics of TCT, unique specifications for a TCT scanner for therapy, patient positioning requirements, and three-dimensional treatment planning. The routine use of TCT in radiotherapy is described. Some problems specifically addressed include: patient positioning, table tops, alignment marks, breathing, contrast materials, and relating therapy scans to other diagnostic studies. An excellent

discussion of present-day industrial developments of TCT for radiotherapy and TCT-assisted treatment planning computer systems.

The final section discusses the value of TCT in clinical dosimetry for the determination of radiation dose. Excellent reviews of current methods and algorithms for radiation absorbed-dose calculations and inhomogeneity corrections are presented. The theoretical bases and use of TCT-derived density values for radiotherapy treatment planning in areas of inhomogeneities are given. The consensus is that TCT-derived values will play a potential role in radiotherapy treatment planning for improved dose estimations in areas of inhomogeneities for photon beams, electron beams, and high LET beams.

In conclusion, the volume is a reference text for those institutions presently utilizing TCT in radiotherapy and for those planning to do so. It is a necessary reference for diagnosticians and radiotherapists who are working collaboratively in the clinical care of radiotherapy patients. The text will be extremely helpful for those medical physicists who have or who are purchasing a TCT-assisted treatment planning computer.

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VASCULAR RADIONUCLIDE IMAGING: A CLINICAL ATLAS. J. T. Ennis, D. J. Dowsett. New York, NY, John Wiley & Sons, 1983, 239 pp, \$85.00

As the title implies, this book is intended to be a comprehensive clinical atlas of radionuclide imaging of the vascular system. It is divided into ten sections: (1) Disorders of the Vascular System; (2) Radionuclide Venography; (3) Radionuclide Aortography; (4) Radionuclide Arteriography; (5) Radionuclide Angiography; (6) Radionuclide Lymphangiography; (7) Nuclear Cardiology—Myocardial Ischemia; (8) Nuclear Cardiology—Ventricular Function, and (9) Radiopharmaceuticals and Instrumentation.

There are obvious overlaps with such finely divided sections, but each deals with a clinical topic in a clearly independent manner, complete with a discussion of radiopharmaceuticals, techniques, interpretation, and comments followed by illustrative cases. (There are, unfortunately, too few cases illustrating cerebrovascular disorders.) The quality of the illustrations of radionuclide images is generally excellent, but the reproduction of some of the radiographs could be better. In addition, the readers may wish to see better correlation of representative cases with other modalities, particularly with those perceived to be more definitive. Because of this relative deficiency, there may be disagreement on the interpretation of some of the illustrative cases.

In spite of some obvious redundancies and the foregoing criticism, the atlas is a good handy reference for vascular nuclear medicine, more so for those who do not often perform all of these procedures.

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OPERATIONAL RADIATION SAFETY-TRAINING (NCRP REPORT NO. 71). National Council on Radiation Protection and Measurements. Bethesda, MD, National Council on Radiation Protection and Measurements, 1983, 49 pp, \$9.00

This NCRP report provides recommendations and criteria for the development and implementation of radiation safety programs for employees working in or near radiation environments. It is not

a book to be used by employees or students in these programs, nor does it focus on specific program content. Rather, it is a concise summary regarding organizational and instructional concepts for those who must develop and present these programs. Recommendations are offered regarding the identification of personnel categories requiring training, the design and development of a training program, the use of various instructional methods and training aids, methods for evaluating training requirements, methods for evaluating training programs, and a variety of other instructional concepts. Particular emphasis is given to two points: (a) that it is the responsibility of management to develop and implement appropriate training programs, and (b) that skilled and dedicated instructors are needed to make these programs effective. Appendices are provided listing suggested topics for radiation safety training, step-by-step examples of the development and implementation of training programs for two selected categories of employees (a secretary in the medical facility and a welder in a nuclear reactor), a list of specific needs for adult learning to be considered in preparing a training program, and a list of selected sources of training materials. The book is interesting, informative, and easily read in a single sitting. All laboratories involved with radiation are required to provide some level of radiation safety training, and a copy of this book should be available for organizers of such programs.

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MAMMOGRAPHY, THERMOGRAPHY, AND ULTRASOUND IN BREAST CANCER DETECTION. L. W. Bassett, R. H. Gold, Eds. New York, Grune & Stratton, Inc., 1982, 172 pp, \$48.00

Mammography, Thermography and Ultrasound in Breast Cancer Detection is a very readable compilation of the state of the art in cancer identification by available imaging techniques. The editors have elicited expert opinion about all phases of breast imaging and included discussion of the associated controversies, benefits, and risks. In addition to the commonly used screen-film mammography and xeromammography ten clinical chapters provide detailed coverage of magnification mammography, TCT mammography, ultrasound mammography, thermography, needle localization techniques, ductography, and electron radiography (XERG).

The major portion of the book, devoted to x-ray mammography, begins and ends with the controversies surrounding the art and science of breast imaging, and clearly defines the relative benefits and risks of breast imaging with ionizing radiation. In the final chapter, the author admits that the benefits of early detection or exclusion of cancer are difficult to quantify as the risk of induced neoplasia from breast irradiation. Nevertheless, he does identify benefit/risk ratios for women of various ages. He also presents information from a mathematical model, which correlates well with clinical experience. It estimates a 2-mo average increase in life expectancy for annually screened women over age 50, and 3-mo increase for annually screened women over the age of 35 (if screening includes both physical examination and mammography). A brief review of cost-benefit analyses is also provided as "food for thought" in this era of prospective reimbursement.

While the details of modern breast imaging may seem abstruse to most nuclear medicine physicians, despite the excellence of the illustrations, each chapter also identifies the obstacles to achieving maximum sensitivity and specificity in breast cancer diagnosis, obstacles of which all physicians involved in cancer management should be aware. The comparative advantages of xeromammography and film-screen mammography are noted: xerography results in higher visibility of calcifications, spiculations, and of the deeper portions of the breast, but reduced visibility of poorly de-