

NUCLEAR MEDICINE ANNUAL 1987.

L. M. Freeman, H. S. Weissmann.

New York: Raven Press, 1987, 351 pp, \$80.00

This volume is the eighth *Nuclear Medicine Annual*. The apparent aim of the series is the presentation, in the context of as wide an audience as possible, of topics of current interest in the field. The editors of this volume have succeeded in this regard, in particular through their emphasis on clinically practical subjects.

The book's ten chapters cover a wide range of techniques and issues. The opening chapter, "Changes in Functional Imaging with Aging" by Richard Spencer and colleagues, is a monumental article for which a Part II is promised next year. It discusses the physiology of aging and its effect on outcome in nuclear medicine tests, and it reports nuclear medicine's contributions to the understanding of aging. The field's failures in this endeavor are also assessed, and the discussion about the direction of future research, that to entail both planar and single photon emission computed tomography (SPECT) imaging, is stimulating. This article is a lengthy and difficult reference piece, and I recommend its close reading to anyone interested in aging or involved in evaluating the function, size, and volume of organs. The reference list is extensive.

Next, Robert Hellman and David Collier address SPECT imaging, concentrating on bone, liver, and heart. They provide a very good section on practical approaches to filtering, with focus on the ramp filter and low-pass Butterworth and Hanning filters. Frans Wackers's well-written "Radionuclide Techniques for Acute Myocardial Infarction" addresses both thallium-201 and wall-motion studies, utilized when the patient arrives at the hospital and when he is about to be discharged.

Two successive chapters are on urologic imaging. Dr. Leonard's report on the Oklahoma experience in the lower genitourinary tract of children covers both direct and indirect cystography, as well as vesicoureteral reflux studies and other clinically useful procedures. A chapter on diuretic renography is very well done by one of the original authorities on the subject, Patrick O'Reilly. Dr. O'Reilly includes a discussion of parenchymal mean transit time and synchronous intrapelvic pressure measurements. Numerous reports on adrenal scintigraphy have recently been published, but it was still refreshing to read Drs. Shapiro, Gross, and M. Sandler's articulate treatment of the subject and their evaluation of the current state of adrenal medulla and cortex functional imaging.

Elissa Kramer and Joseph Sanger emphasize melanoma and breast cancer, with a look at ilio pelvic and peripheral lymphatics, in their assessment of the current status of lymphoscintigraphy. There is no question that this technique will increase in importance as nuclear physicians define its use and limitations and as fewer radiologists are interested in the technically difficult contrast lymphography. George Pjura and Edmund Kim's chapter on radionuclide evaluation of brain death is well written and, except for omitting a discussion on the choice of radiopharmaceutical e.g., technetium-99m (^{99m}Tc) labeled red blood cells versus [^{99m}Tc]pertechnetate, is comprehensive.

The ninth chapter, "Therapy with Intra-arterial Microspheres" by John Harbert and Harvey Ziessman, covers the basic principles of its subject well and is stimulating, but the discussion is a jumble of diagnostic and therapeutic uses of the procedure. The volume closes with an innovative paper by Glen Dalrymple, Charles Boyd, and James Doherty. "Multicompartmental Analysis for the Nonmathematician" is written for those who have avoided this approach because of its mathematical complexities. The authors define compartments, explain first-order linear differential equations, and distinguish variables from constants in this context. They also give an overview of modeling biomedical systems. The chapter is also a good practical guide to the software STELLA but at times in this regard is too much of a user's manual.

Overall, this is an excellent volume of *Nuclear Medicine Annual* and I highly recommend it to nuclear medicine physicians, whether in academics or private practice. There are only a few editorial errors, but they must be watched for: for example, on page 5, *antigen* is printed instead of *antibody-secreting cells*. The quality of the images, while acceptable, is by no means up to the standards of the text or the standards that the reader should expect. The most recent references in some articles are 2 or 3 years behind the 1987 publication date of the book. I would urge the publisher and the editors to adhere more precisely to their deadlines.

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NEW APPROACHES TO TUMOUR IDENTIFICATION. CANCER SURVEYS; ADVANCES & PROSPECTS IN CLINICAL, EPIDEMIOLOGICAL AND LABORATORY ONCOLOGY

K. E. Britton, Ed. Oxford, U.K.: Oxford University Press, 1987; 400 pp. Soft-cover, \$30.00

This booklet is a soft-covered compilation of ten excellent topics which are of interest to all involved in oncologic imaging. As the editor states in the preface, a tumor is no longer detected only by its physical attributes such as size, shape, position and displacement of other tissues, but now by using its essential cancerousness as the means of its identification. How to use the differences of normal and cancerous tissues in tumor identification both in vitro and in vivo is less clear and forms the basis of this special issue of the Cancer Surveys, which have been published quarterly.

Chan and Sikora discuss the possibilities of using the altered expression of oncogenes and their products in neoplastic tissues as markers for the diagnosis, prognosis and monitoring of human malignant disease. Recently developed immunohistological techniques coupled with the advent of the monoclonal antibody era have revolutionized diagnostic tumor pathology. This theme is taken up by Bobrow and Norton in demonstrating a means of early, more objective, diagnostic assessment of neoplastic lesions by the recognition of changed antigenic phenotype in preinvasive neoplastic cells.

Kemshead and his colleagues also pursue this theme in the context of neuroblastoma using monoclonal antibodies for a better understanding of the definition of good and poor risk patient groups. With the availability of the correct screening procedures and gene replacement techniques, the future for neuroblastoma as a disease with a poor prognosis may be limited.

The technique of using an antibody against some appropriate tissue antigen, radioimmunoscinigraphy, to image primary or metastatic malignant tissue and the ways it may be improved are described by Britton and Granowska. Radioimmunoscinigraphy still has a long way to go before it plays a major part in the management of cancer. Radioimmunotherapy can then follow to target the cancer cell characterized in vivo by radioimmunoscinigraphy.

An unusual approach is taken by Niemtzou in utilizing electrophysiological properties of the cancer cell to measure transmembrane potentials in the investigation of malignant cellular proliferation, the influence of malignant disease on normal cell physiology and chemical carcinogenic events and possibly as an in vivo measurement in the cancer patient. Mountford and Tattersall re-evaluate existing knowledge of the proton magnetic resonance properties of cancer cells and assess the future potential of magnetic resonance spectroscopy in tumor biology and cancer diagnosis and management. An understanding of the biologic importance of lipid changes in the cell membrane paves the way to high resolution spectroscopy being useful in classifying tumors, and perhaps in tumor imaging. The specific role of spin lattice relaxation time in the liver, spleen and marrow of patients with lymphoma is discussed by Richards. Marked changes in T1 have been observed after treatment both in nodal and in extranodal sites. The importance of these changes in terms of the use of magnetic resonance imaging for assessing response to therapy merits further study. The general application of magnetic resonance imaging of cancer is documented by Turnbull and Kean. Magnetic resonance imaging has proven beneficial in staging, but it has not been possible to characterize histologic tissues.

The diagnostic imaging procedures now available for the identification of tumors are many and often duplicated. An understanding of the advantages and limitations of each radiological technique for the identification of tumors in children is briefly described by Carty. The role of radiology in the protocols for the treatment of childhood cancer is also discussed, but no attempt is made to indicate how each specific tumor should be investigated. Finally, the clinical applications of computed x-ray tomography in tumor identification are

reviewed by Conry and Reznek. The advantages and limitations of the technique are highlighted in the context of tumor presentation, staging and subsequent management. Particular emphasis is laid on the ability of CT guided biopsy techniques.

The topics, timely important subjects, are well written, very informative, and a pleasure to read. The layout of the topics is excellent and there is a good index. There are very few figures, presumably due to limited spaces for the size of this booklet.

This booklet should appeal to oncologists and imaging specialists. I also consider this an excellent resource for the training oncology and radiology residents, or anyone who needs to, wants to, or should know about new approaches to tumor identification.

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Books Received

New Approaches to Tumour Identification. Cancer Surveys: Advances and Prospects in Clinical, Epidemiological and Laboratory Oncology. Vol. 6, No. 2. K. E. Britton, Ed. Oxford, Oxford University Press, 1987, 400 pp, \$30.00

Complications in Diagnostic Imaging. Second Edition. G. Ansell, R. A. Wilkins, Ed. Chicago, Year Book Medical Publishers, 1987, 540 pp, \$208.00

Cerebrospinal Fluid and the Brain Edemas. T. H. Milharat. New York, Neuroscience Society of New York, 1987, 168 pp, \$45.00

Magnetic Resonance Imaging. D. D. Stark, W. G. Bradley. St. Louis, C. V. Mosby, 1987, 1516 pp, \$199.00

Current Problems in Neurology: 5 Impact of Functional Imaging in Neurology and Psychiatry. J. Wade et al. London, John Libbey & Company, Ltd. 1987, 208 pp, \$46.00

Graph: Scientific Plotting/Data Transformation. MicroMath Scientific Software. Salt Lake City, MicroMath, Inc., 1988, 81 pp, \$79.00

Intermediate Physics for Medicine and Biology. Second Edition. R. K. Hobbie. New York, John Wiley & Sons, Inc., 1988, 623 pp, \$54.60