

BOOK REVIEWS

SINGLE PHOTON EMISSION COMPUTED TOMOGRAPHY AND OTHER SELECTED COMPUTER TOPICS. New York, Society of Nuclear Medicine, 1980, 244 pp, illustrated, members SNM \$18.00; nonmembers \$27.50

The book is a collection of papers presented at the 10th Annual Symposium, Society of Nuclear Medicine Computer Council, which was held in Miami Beach in January, 1980. As the title suggests, most of the papers deal with the subject of emission computed tomography—both longitudinal and transverse. Also included are a number of papers on a variety of subjects that are computer related.

The subject of longitudinal, single-photon, computed tomography is covered thoroughly in chapters on the seven-pin-hole tomographic system, bilateral and quadrant slant-hole collimator systems, and the Anger tomographic scanner (Pho/Con). These six papers describe the physical performance parameters, and some compare various approaches.

Transverse section imaging is discussed in five chapters that include descriptions of rotating camera systems and a single-slice multidetector system (CLEON). Although an introductory chapter discusses the general principle of convolution backprojection, the others deal with very specific problem areas.

Other computer-related subjects range from quantification of left-to-right cardiac shunts, to a description of a three-dimensional display and iron-59 whole-body retention analysis. Many of these papers are well written and contain valuable information, but appear to be misplaced. For example, I would not have expected to find information on counting losses and Anger camera pile-up rejection in this volume.

Throughout my reading of this book, I was struck by the fact that much of the information had been already published. Although some of the authors made an obvious attempt to include only material not published before, others built on previously published material and added small sections that were new. While it has become distressingly common for investigators to use the same set of slides in many oral presentations on the argument that at least a few members of the audience may not have seen all of them, it is an alarming trend when the same figures and text reappear in publication after publication.

This book provides a quick overview for those who are becoming interested in single-photon computed tomography and contains some interesting detail for those who are working in the field.

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NUCLEAR MEDICINE: HEPATOLIENAL. B. Rothfeld, Ed. Philadelphia, Toronto, J. B. Lippincott Co., 1980, 255 pp, illustrated, \$45.00

This book compiled by Dr. Benjamin Rothfeld has 24 contributors. With the previous experience of both editor and authors, one could predict a favorable outcome. There is some redundancy, as expected in a multiauthored text, but this may aid readers who dwell on a single chapter. The repetition was particularly noticeable in the immunologic discussions on the viral hepatitis antigens and on the technique of imaging. I found the first four chapters on liver anatomy and imaging of greatest clinical value. I even searched for defects rather than plaudits. What does the book say about the difficulty in the diagnosis hepatic hemangioma? There

it was in the index and succinctly answered on page 54, “. . . many hemangiomas have prominent blood pool activity in the late images, contrasted with relatively little early perfusion in dynamic images.” The authors do not hesitate to point out situations where other imaging modes are of equal or greater value, e.g., ultrasound, CT, and contrast angiograms.

Even a good book, however, has its faults. The chapters are uneven in quality. I would like to see more than a paragraph written on splenic trauma, especially in a book that devotes chapters to: (a) radioassay of bile acids, alpha-fetoprotein, and carcinoembryonic antigen; (b) uses of C-14 for clinical studies of albumin and protein synthesis; and (c) clinical radioactive breath tests. My personal experience has not shown that “50% of patients with metastases have the classical ‘tumor stain’ on scintangiography of the liver” (page 84). This comment appears to contrast with the statement that the “arterial supply to metastatic cancers is usually scanty” (page 124). Another author states that “radionuclide scanning, CT, and ultrasonography are relatively inexpensive.” Relative to what?

The book is directed to a wide audience, and I enjoyed reading it. The chapters on parenchymal cell localizing agents (3) and viral hepatitis (9-11) are worth the price of the entire book. Perhaps we are all drowning in a sea of knowledge, but some broader base is required to interpret our data, which includes the useful and unexpected clinical information contained in this book. The text has very few typographical errors and is of excellent quality.

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QUALITY ASSURANCE OF RADIOPHARMACEUTICALS—A GUIDE TO HOSPITAL PRACTICE. (A special issue of *Nuclear Medicine Communications*) M. Frier, S. R. Hesslewood, Eds. London, Chapman and Hall (in association with the British Nuclear Medicine Society), 1980, 57 pp

“The document is intended to give guidance to all persons involved in the preparation and use of radiopharmaceuticals on method used in quality assurance and their application,” quoting the editors in their preface. This little monograph is very handy, but it is insufficient as a general reference book and does not contain cited references. Some of the information provided differs from the traditional practices of radiopharmacy in the U.S. and other countries.

The book discusses, in outline form, the quality-control parameters and the process controls used to assure radiopharmaceutical quality. The general discussion includes six tables, some of which are highly useful, such as Table 5—Chromatography Systems, which lists procedures determining the major radiochemical impurities in the most common radiopharmaceuticals. R_f values of the impurities are listed. The last part of the book is a series of 30 compendium-like monographs for the quality-control testing of common radiopharmaceuticals.

A group of 19 individuals contributed to the compilation, so the procedures probably represent an accurate survey of radiopharmaceutical quality-control practices in Great Britain. I find that the lack of references limits the usefulness and credibility of the methods and standards. For example, the expiration time of sodium pertechnetate is given as 8 hr with storage at 2-4 °C. I am not aware of data or literature reports that validate this recommen-

dition. Cold storage of sodium pertechnetate is not common U.S. practice. Individual monographs list *Organ Specificity* but times, animal species, and methods are not given so the utility of these specifications is obscure.

The concept of using various process controls is an important dimension of quality assurance often omitted in previous quality-control discussions. Unfortunately, the two most important process controls, monitoring for aseptic technique in drawing and dispensing doses and monitoring personal radiation exposures and biocontamination, are not included. This booklet is a step towards providing a handy, quick, quality-control reference; however, it should be used with other texts or other references from current nuclear medicine practice.

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QUALITY ASSURANCE IN DIAGNOSTIC RADIOLOGY. Medical Physics Monograph No. 4, American Association of Physicists in Medicine. New York, American Institute of Physics, 1980, 180 pp, members AAPM \$10.00; nonmembers \$20.00.

This monograph contains the proceedings of the symposium "Higher Level Quality Assurance in Diagnostic Radiology" held in Cincinnati in July, 1977. The stated purpose of the monograph is to "enable technologists working with the guidance and supervision of a medical physicist to set up a viable quality assurance program in diagnostic radiology with minimal expense." Although the publication provides considerable useful information, it does not achieve its stated purpose uniformly throughout the text. This shortcoming occurs because much of the information is not suitable for use by technologists, and almost no information is provided about the cost of required test instrumentation, manpower commitment, or methods to evaluate the effectiveness of quality-assurance procedures. Another deficiency is the unfortunately long delay between the date of the symposium (July 1977) and the publication of the proceedings (December 1980).

The book is divided into 13 chapters covering the need for higher level quality assurance (Chap. 1), assessment of automatic exposure and brightness control systems (Chap. 2), evaluation of generator performance (Chap. 3), photographic processor quality control (Chap. 4), cineradiographic systems (Chap. 5), image intensifier and television systems (Chaps. 6 and 7), the modulation transfer function (Chap. 8), x-ray filters and beam quality (Chap. 9), protection surveys (Chap. 10), radiation exposures to patients (Chap. 11), testing results on certified equipment (Chap. 12), and description of an approach for a unified view of radiological imaging systems (Chap. 13). Although useful information is presented in each chapter, the most practical information is found in Chaps. 1-5, 9-11. The information in Chap. 11 on radiation doses from diagnostic procedures is particularly valuable since it presents an excellent overview of the subject with an extensive reference list.

This book represents a useful addition to the literature in the area of quality control, and it is recommended to those individuals actively involved in the field.

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PHYSICAL TECHNIQUES IN MEDICINE. Vol. 2. J. T. McMullan, Ed. Chichester/New York/Brisbane/Toronto, John Wiley & Sons, 1980, 158 pp, illustrated, \$45.00

This is the second in a series on biomedical engineering subjects written by authors from the United Kingdom and South Africa. The aim of the series is to "discuss these physical techniques and to present the necessary background together with clinical appli-

cations." In the preface, we learn that the series "is intended to meet the needs of students and research workers in medicine, medical physics, bioengineering, and related areas."

In this second volume, the five chapters are: The CAT Scanner, Pressure Sores, Hyperbaric Medicine, Cryosurgery, and Radiation Therapy. Although the level of these chapters indicates they are intended for the beginner, the depth varies significantly from chapter to chapter. The mathematical level is elementary throughout this book. A comprehensive index is provided.

The discussion of the CAT Scanner is particularly disappointing: the level of treatment is very superficial, the illustrations are poor, and many of the statements made in the text, especially those relating to clinical applications, are remarkably naive. The discussion of reconstruction procedures does not include filtered back-projection. Eight references are provided, but the best texts and reviews on the subject are omitted.

Upon reading this chapter, radiologists and nuclear medicine specialists will be interested to learn that "it is not possible to see through the heart shadow" on conventional chest x-rays. Potential purchasers of CAT scanners will be loathe to find that "the price of a CT scanner is probably similar to the price of a commercial airliner or a new sports stadium: certainly it is a good deal less than that of a nuclear submarine." Such erroneous comments are common in this chapter.

The discussion of radiation therapy in 21 pages with seven figures and five tables is necessarily rather superficial. This is an honest effort, however, and a novice may digest the material quickly in a single sitting. Only four references are provided, none more recent than 1978. The author refers to his 1974 text on the subject, published in England, but no current American texts are mentioned.

The remaining chapters on pressure sores, hyperbaric medicine, and cryosurgery treat their rather narrow subjects in greater depth, and each is accompanied with appropriate references.

This book, with the exception of the chapter on CAT scanners, may be useful for beginning readers with general interest in the topics presented.

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COMPUTERS IN ULTRASONIC DIAGNOSTICS. P. N. T. Wells, J. P. Woodcock. Forest Grove, Oregon, Research Studies Press, 1980, 94 pp, illustrated, \$27.50

This is volume 1 in the Medical Computing Series (edited by D. W. Hill). This brief monograph is organized into ten sections, each with appropriate tables and illustrations and a set of references for each section. A total of 107 references is provided, but they are somewhat dated. An extended table of contents is provided, but there is no index.

The sections include data acquisition, data recording and digitization, signal analysis and processing techniques, ultrasonic tomographic reconstruction, digital picture enhancement, feature extraction and pattern recognition, three-dimensional applications, and examples of some early ultrasonic imaging computer systems.

The mathematical level of the monograph requires some prior knowledge of Fourier, Laplace, and z transforms. Both one-dimensional pulse echo and Doppler technology are considered. Real-time two-dimensional scanners and small-parts scanners are not treated in depth. The commonplace, digital, solid-state scan conversion memory was not in wide use at the time the monograph was written and therefore is not described in detail.

The material relating to specific computer systems and ultrasonic data acquisition and processing hardware is badly out of date. The reader can, however, develop an appreciation of the level of development of ultrasonic computer technology several years ago.