

appreciation of sectional anatomy has become a necessity for clinicians as well as for anatomists and radiologists. Although all physicians have studied gross anatomy during their medical school training and other specialists have extensively considered topographical anatomy during their postgraduate training, few have covered sectional anatomy with the intensity required for the interpretation of tomographic images. Clinical interpretation of the data from the newer diagnostic modalities requires a knowledge of the anatomy and relationships as viewed from several sectional perspectives.

This atlas by Koritké and Sick comprises two volumes, one covering head, neck, and thorax and the other the abdomen and pelvis. The high quality of the material presented is directly related to the attention devoted to the preparation of the specimens. The subjects used were predominately young adults without known abnormalities, thus providing sections that are complete and without pathologic variables. Depending on the requirements of the plane, sections were made from 1.5 cm to 2.5 cm in thickness.

In both volumes the format is constant—on one page there is a photograph of the anatomical section and on the opposite page a line drawing of the section with leaders. In a pocket on the inside back cover, an index of each section lists the abbreviations for the leaders. Each anatomical section is reproduced to a specific scale, and a transparent rule that contains the several scales is furnished. The volumes present horizontal, frontal, and sagittal sections of the entire body except the extremities. The photographs of the cut sections of the body are consistently superb, offering outstanding detail. The accompanying diagrams display the main characteristics of the section without excessive detail and confusion.

The attention extended by the authors to the selection of subjects, the methods of tissue preservation and sectioning, the processing of the body sections to maintain anatomical relationships, the photography, and the correlative diagrams have resulted in one of the finest atlases of this type yet published. These volumes are highly recommended to all clinicians and basic scientists who have a need for such reference material. The authors are to be commended on the results of their endeavors.

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COMPUTED BODY TOMOGRAPHY. Joseph K. T. Lee, Stuart S. Sagel, Robert J. Stanley, Eds. New York, Raven Press, 1982, 602 pp, \$80.00

Computed Body Tomography provides the radiologist with a very much needed standard reference textbook of body CT. The editors and contributors are well-known pioneers and authorities in this field. The contents are conveniently divided into chapters according to anatomical region. In each chapter there is discussion of normal anatomy and of a variety of common pathologic conditions. A long list of excellent references is included at the end of the chapters.

The chapter on the spine may not be as detailed as would be found in more dedicated textbooks on this area, but it adequately covers the pathology and diagnostic problems. Chapters on pediatric application, comparative imaging, and radiation oncology amplify the scope of this book. In addition, I found the historical review in the foreword and the discussion of the economic-political aspects of CT interesting and informative.

Aside from the well-written and easy-to-follow text, the illustrations produced from current generation scanners are of high quality. As many are aware, the main shortcoming of some older textbooks is that the illustrations used were those obtained with second generation scanners. I highly recommend this text as a reference book on body CT for both radiology residents and our

colleagues in practice.

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QUALITY CONTROL IN DIAGNOSTIC IMAGING. J. E. Gray, N. T. Winkler, J. Stears, E. D. Frank. Baltimore, Maryland, University Park Press, 1983, 249 pp, \$34.95

This book is aimed at the very practical questions concerning quality assurance in diagnostic radiology. As such, its utility in nuclear medicine is confined to general advice on quality assurance and quality control (QC), both as to the performance and the attendant paperwork, and to those devices and techniques that nuclear medicine shares with diagnostic radiology, such as film processing, video hard-copy cameras, copy film, and viewboxes. The book combines many different facets of quality assurance, usually very felicitously.

In particular, the first chapter wades into the questions of who should do quality control testing and how it can be combined with other duties; how many people should be involved (from a part-time QC technologist and a full-time service engineer with a physicist in consultation for a facility of five to 15 rooms to one QC technologist and one full-time engineer for every 3 million dollars worth of equipment, along with a physicist in residence); how frequently the equipment should be checked; what to evaluate; and whether in-house service pays its own way (they feel it does). This chapter could easily be generalized to nuclear medicine practice.

The second chapter combines a list of the equipment needed for a QC program with discussions of specific pieces of equipment (such as phantoms and dosimeters), of some of the paperwork, and of the need to have a QC cart to carry the equipment. The "heel effect" is also discussed in this chapter although it belongs more appropriately in Chapter Six. The general and paperwork parts of this chapter could readily be adapted to any QC program.

Chapter Three discusses the basics of quality control, including charts and room logs. The specifics are put into a "Procedures" section at the end of the chapter—everything is spelled out in this section, which is written in the format of instructions for a scientific experiment and includes a "Problems and Pitfalls" discussion for each procedure. In Appendix A, there are suggested charts and forms specifically designed to allow copying for use. Of course, these forms are specific for radiographic equipment, but a great deal of thought has gone into their design. They could well be studied for hints in design, and the general discussion of this chapter could be very valuable.

The fourth chapter discusses reject-repeat analysis. This issue is more critical in diagnostic radiology where each repeat means more radiation dose to the patient. However, a thorough examination of the reasons for repeated views and repeated examinations might be relevant in nuclear medicine to limit patient (and technologist) radiation dose as well as for economic purposes.

Chapter Five concerns photographic quality control. This chapter could be applicable to any nuclear medicine service that cannot rely on a quality assurance program run by diagnostic radiology to check the processors and darkrooms and to clean and maintain them. The chapter also gives specific procedures for processor replenishment for low-volume processors (less than 25–50 sheets of 14 × 17 inch film per 8 hr), information which could be of interest to those in small, isolated nuclear medicine services.

Chapters Six, Seven, and Eight are very specific to diagnostic radiology equipment. Chapter Nine includes a discussion of TV monitors, video tape, and disk recorders. The tests are qualitative and carry the caveat that since the monitors are such an integral part of the system, the checks may only provide an indication of

trouble, but not its location. There is also a discussion of video waveform monitoring. This area is quite specialized and might well be something to call on engineers or personnel from diagnostic radiology to perform on nuclear medicine equipment. Chapter Ten relates to special diagnostic imaging systems, such as portable instruments, tomographic equipment, and special procedures suites. All of these chapters use photographs of equipment and films to illustrate their points, and in general, the reproduction is good and the images match the captions. I would quarrel with a couple of them, but nearly always good examples were chosen and used in the correct places.

Chapter Eleven includes discussions of miscellaneous tests and techniques grouped together: video hard-copy cameras, image quality tests for product comparison, attenuation measurements, copy film, methods for lowering fluoroscopic dose rate, what to do before the service engineer *leaves*, and film viewboxes. Chapter Twelve, which covers equipment specification, purchase, and acceptance testing, belongs with Chapter Eleven. This chapter shows evidence of being an afterthought, for some of the topics could have been more thoroughly covered. Video hard-copy cameras might well have been described with the video monitors themselves, and there is no discussion of the problems and causes of nonuniformity across the field, which is so often evident in images created with these devices. Product comparison should have been included in Chapter Twelve on equipment purchase. The discussion on lowering fluoroscopic exposure rate belongs in the section dealing with other fluoroscopic topics. Chapter Twelve devotes two pages of helpful advice on equipment purchase, and it is supplemented by Appendix B, which contains a whole set of equipment specification forms, meant for copying. The authors suggest the use of these forms to avoid the problems that arise when vendors do not specify the same parameters or answer the specifications in an RFP in the same fashion. Only a few of these forms could be used in nuclear medicine and, curiously, there is no form for film processor specification.

Overall, the book is more enjoyable than a book on quality control and quality assurance might be expected to be because of the inclusion of the "Problems and Pitfalls" sections and the anecdotal discussion in the chapters. I kept wishing for such a volume devoted to nuclear medicine. However, it occurred to me that this book is curiously old-fashioned, because it does not mention computers or digital devices, either as radiologic equipment or as tools in the QC trade. This omission would have to be addressed in the nuclear medicine equivalent of this book.

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QUALITY ASSURANCE IN NUCLEAR MEDICINE. World Health Organization. Geneva, Switzerland, World Health Organization Publications, 1982, 72 pp, \$5.50

This guide resulted from a week-long workshop on quality assurance (QA) in nuclear medicine, held in Heidelberg, West Germany, in November, 1980. Dr. R. F. Mould of London served as Rapporteur for the contributions of the 36 workshop participants from 17 nations. Quality assurance is defined by the authors as all those planned and systematic actions necessary to provide adequate confidence that a structure, system, or component will perform satisfactorily in service.

The text is divided into chapters on: definition of the problem, organization of quality assurance programs, quality control of nuclear medicine instrumentation, quality control of radiopharmaceuticals, records and evaluation of clinical results with special reference to quality assurance, phantoms, and conclusions. The authors describe the relationships among international, national, and local organizations that foster efficient practice of nuclear medicine. Helpful tables are provided that specify routine performance tests for (a) activity meters (radionuclide "dose" calibrators), (b) gamma cameras, (c) single photon emission computed tomographic (SPECT) systems using rotating cameras, (d) rectilinear scanners, (e) single- and multiprobe counting systems for gamma radiation measurements in vivo, (f) manual and automatic counting systems for gamma radiation measurements in vitro, and (g) data-processing systems.

The chapter on QC of radiopharmaceuticals is brief and somewhat superficial but provides many pertinent references to the literature.

The authors describe an area of QA often neglected—i.e., the clinical diagnostic study itself and the subsequent accumulation of patient records. To use these records efficiently, excellent flowcharts have been developed that trace the pathways through the studies and demonstrate how to gain the maximum information from them, thereby providing information for future studies.

The text covers flood-field phantoms, a count-rate performance phantom, a resolution and linearity phantom, a step-wedge phantom, total performance phantom, and a phantom for use with SPECT systems. Finally, there is a useful glossary.

For anyone establishing or directing a nuclear medicine department, this modestly priced book is essential reading to ensure that clinical diagnostic procedures are performed in the most efficient manner possible. The text is concise and clearly written.

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BOOKS RECEIVED

Noninvasive Diagnostic Methods in Cardiology. Noble O. Fowler, Ed. Philadelphia, PA, F.A. Davis Company, 1983, 411 pp, \$50.00

Nuclear Medicine Annual 1983. Leonard M. Freeman, Heidi S. Weissmann, Eds. New York, NY, Raven Press, 1983, 408 pp, \$39.50

Ultrasound Annual 1982. Roger C. Sanders. New York, NY, Raven Press, 1982, 363 pp, \$51.50

Progress in Radio-Oncology II. K.H. Karcher, H.D. Kogelnik, G. Reinartz, Eds. New York, NY, Raven Press, 1982, 510 pp, \$60.00

The Human Environment—Past, Present and Future. (The Lauriston S. Taylor Lecture Series in Radiation Protection and Measurements, Lecture No. 7). Merrill Eisenbud. Bethesda, MD, National Council of Radiation Protection and Measurements, 1983, 40 pp, \$11.00

Ultrasound (Environmental Health Criteria Series—22). World Health Organization. Geneva, Switzerland, World Health Organization, 1982, 199 pp, \$8.00

Lasers and Optical Radiation (Environmental Health Criteria Series—23). World Health Organization. Geneva, Switzerland, World Health Organization, 1982, 154 pp, \$6.50