

Practical Nuclear Pharmacy, 3rd Edition

Trent Phan, PhD, Michael Ling, MD, and Richard Wasnich, MD, Banyan Press, 1987, 146 pp., \$14.95.

Divided into four specific parts, this book reviews currently used radiopharmaceuticals in nuclear medicine. Part I presents general properties related to radiopharmaceuticals, including both NRC and FDA regulations, the transportation of radiopharmaceuticals, and radiochemical, radionuclidic and biologic quality control procedures. A brief synopsis of dose calibrator quality control procedures, pediatric radiopharmaceutical doses, and adverse reactions is also included. Part II discusses the properties of specific ^{99m}Tc radiopharmaceuticals, including $^{99m}\text{Mo}/^{99m}\text{Tc}$ generator systems and approved as well as investigational radiopharmaceuticals. For each specific agent, the method of preparation, quality control procedures, biological behavior, clinical uses, and appropriate references are listed. Part III focuses upon iodinated radiopharmaceuticals, including ^{123}I , ^{125}I , and ^{131}I products. Part IV includes a description of other non- ^{99m}Tc /noniodinated radiopharmaceuticals and brief information on positron emitting radiopharmaceuticals, cell radiolabeling methods, $^{81}\text{Rb}/^{81m}\text{Kr}$ generators, and the newer brain imaging agents. The textbook ends with a number of tables and a list of radiopharmaceutical suppliers and their products.

The textbook serves as a useful reference guide for radiopharmaceuticals used in nuclear medicine. Although each radiopharmaceutical or procedure is described in a cursory manner, references are listed if more in-depth analysis is needed. The primary criticism of this textbook is that the authors fail to provide a more extensive list of references for each topic covered. If one is to effectively utilize a textbook on radiopharmaceuticals as a general guide, complete references are mandatory.

The textbook serves as both a useful introduction and as a refresher of cur-

rently used radiopharmaceuticals, and should be part of the nuclear medicine reference library. This book is also recommended to those students and scientists interested in nuclear pharmacy.

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The Scintillation Camera

Guy H. Simmons, Editor, Society of Nuclear Medicine, 1988, 140 pp., \$35.00.

The Instrumentation Council of the Society of Nuclear Medicine has enlisted a group of expert authors to write this useful and lucid description of the modern gamma camera. The monograph is intended for a broad audience including technologists, physicians, and scientists. No previous work has assembled such a detailed description of the major components in a gamma camera.

The book is divided into seven chapters, each written by an author with expertise in a particular area. Chapter 1 discusses the basic components of the detector assembly, including the crystal, light pipe, and photomultiplier tubes. The historical development is also discussed for those who might enjoy reading the early references on the device which forms the backbone of nuclear medicine.

Chapter 2 discusses the properties of collimators, and will probably be considered by most readers to be the most mathematically challenging reading in the book. Collimator response is described by geometric penetration and scatter components, and the common collimators (parallel-hole, pinhole, converging, diverging) are mathematically described. The reader searching for practical advice on collimator selection may be overwhelmed here because of the complex inverse interaction between sensitivity and resolution in collimator design. Ultimately, the author does suggest a relationship between the required FWHM of the collimator for the size and type of the object to be imaged.

The discussion of modern gamma camera microprocessor methods for on-line correction of uniformity and linearity is very descriptive and will help many readers to better understand the terminology used by camera manufacturers in describing their product. Breaking down the correction methods into correction for energy, linearity, and photomultiplier tube drift is most helpful in deciding the possible virtues of one camera design over another. This chapter also appeared in a recent JNMT article (*J Nucl Med Technol* 1988;16:82-89). Images of floods and resolution phantoms are presented, which clearly show the improvements in performance with these correction techniques.

Chapter 4 is a review of display devices used on gamma cameras, from CRTs to multiformatters to laser formatters, with a too brief discussion of video display hardware. The importance of the display system is an often overlooked vital component in the imaging process, and this chapter reviews available options. Further discussion of video display technology probably is the realm of a discussion on nuclear medicine computers—a realm which the editor clearly states is reserved for a future monograph.

The final chapters of the book deal with quality assurance and performance parameters. The common tests of quality assurance for flood uniformity and resolution are discussed, and flood artifacts are illustrated with images. The distortion of bar phantom images by Moiré patterns also is illustrated, and a discussion ensues on the virtues of various resolution phantoms and their relationship to the manufacturer's spatial resolution FWHM specifications. The author makes clear recommendations for appropriate testing frequency. Chapters 6 and 7 cover writing specifications for equipment purchase and with acceptance testing after the purchase is completed. These chapters will be welcomed by anyone who has ever wrestled with a side-by-side comparison of NEMA parameters. Useful suggestions are made to first decide on the intended clinical use for

the camera, and then to get a written agreement on demonstration of performance parameters of importance to the intended clinical use. A perhaps too strong recommendation is made for using the same vendor for the camera and computer purchase. The discussion reminds the reader of details that are often overlooked (e.g., the importance of a quality EKG gating device). NEMA parameters, and the experimental details of their measurement, are well described

in the chapter on acceptance testing. This should make many readers capable of measuring certain NEMA performance standards using their nuclear medicine computer system. Even readers without a computer are helped by suggestions on how to measure performance parameters without an interface computer.

This book would be a useful addition to the collection of anyone concerned with the technical details of the gamma camera. The only major deficiency in

this book was insufficient discussion on SPECT imaging. It would have been helpful to discuss concerns of rotational motion, gantry control, and the extra-critical parameters of quality assurance and performance in SPECT imaging.

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