

# JNMT Bookshelf

## **SINGLE-PHOTON EMISSION COMPUTED TOMOGRAPHY: A PRIMER**

Robert J. English, CNMT and Susan E. Brown, CNMT, Society of Nuclear Medicine, New York, 1986, 148 pp, \$17.00.

Single-photon emission computed tomography (SPECT) is being increasingly used in routine clinical procedures. The information necessary to perform good SPECT is spread throughout a diverse collection of literature. For this reason, the authors set about the task of consolidating the information into one volume, thereby assisting nuclear medicine technologists in expanding their knowledge of the modality. Such an objective is to be commended and I was excited by the prospect of reviewing this text. My initial enthusiasm was, however, tempered by the errors and/or omissions that I discovered.

This small, plentifully illustrated paperback contains chapters titled "Image Reconstruction," "Quality Control Requirements," "Acquisition Parameters," "Processing Techniques," and "Clinical Applications." Each chapter is followed by a summary, a suggested readings list, and a set of multiple-choice questions (answers are provided in the back of the book). Seven short appendices cover suggestions for quality control, examples of SPECT data collection, an overview of SPECT, a mathematical model of backprojection, filtered backprojection, two-dimensional Fourier transformation, and concepts of attenuation correction. The book concludes with a comprehensive, but somewhat disappointing, glossary of terms associated with SPECT, to familiarize new readers with the jargon.

Although the text is a primer, it was disappointing to find a lack of attention to detail. For instance, the term "Hanning" has crept into the vocabulary, which should be Hann, although perhaps there has been some confusion with Hamming. The latter is a different person who described a different filter. In addition, some of the figures in the first printing of this book are poor quality representations of the points being demonstrated.

Image reconstruction is described in some detail, but the discussion of two-dimensional Fourier reconstruction leaves much to be desired. The mere use of Fourier transforms does not make the procedure more "straightforward" or "elegant." The appendix provides no clarification for persons unfamiliar with the Fourier transform.

The authors acknowledge the importance of quality control in SPECT, but do not discuss this topic sufficiently. It is implied that once the camera has been acceptance tested for planar imaging, the next procedure is to perform SPECT

acquisition with a total performance phantom. Only after this has been mentioned do the authors state that center of rotation measurements and uniformity floods are critical. I cannot agree with the concept that pixel sizing and head tilt are of "secondary consideration." Image/matrix alignment is part of the center of rotation offset and should be treated as such.

The section on clinical acquisition parameter considerations for different body organs is useful. However, much of this discussion focuses on research topics, namely, the use of  $^{123}\text{I}$ -labeled amines for cerebral blood flow, slant-hole collimators, and long-bore collimators.

The chapter on processing techniques deals well with backprojection, the ramp filter, and filter windows. Attenuation correction techniques are mentioned only briefly, although this is the subject of an appendix.

The final chapter on clinical applications provides a useful description of the various tomographic planes and the commonly accepted orientation of displays of those slices. The final section demonstrates some of the disease processes that have benefited from the application of SPECT technology.

This book is, as the title states, a primer for technologists. It cannot be regarded as a reference text on the subject of SPECT. The suggested reading lists will help to provide more detailed information. It does not describe topics in easily understood terms and, unfortunately, contains errors that, although not serious, demonstrate an inattention to detail. This book will prove useful in departments where SPECT is just being introduced; it cannot be recommended as a "must" for every technologist, although it certainly provides a value for the price.

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*Editor's note—This review is of the first printing of SPECT: A Primer. A second printing, with revised figures, will be available in December 1986.*

## **NUCLEAR PHARMACY: AN INTRODUCTION TO THE CLINICAL APPLICATION OF RADIOPHARMACEUTICALS**

Henry M. Chilton, PharmD and Richard L. Witcofski, PhD, Lea & Febiger, Philadelphia, 1986, 190 pp, \$22.50.

In their preface, the authors state the need for an introductory text for students of nuclear pharmacy (including pharmacists, physicians, and technologists) that covers the subject matter

in sufficient depth to be of permanent value, and that presents it in a clear and understandable manner. Because the book is intended as an introductory text in nuclear pharmacy, the discussion of clinical applications is not exhaustive and details only the major applications of each radiopharmaceutical. To facilitate study of clinical chapters, a general organization is followed: principle of the study, indications, radiopharmaceutical data, methods, and special considerations/patient preparation.

The book accomplishes all of these goals. This introductory text reviews fundamental concepts of nuclear pharmacy in a logical, practical, understandable manner, from basic principles through clinical applications. The text is superbly illustrated and contains 19 chapters, which cover topics from the basic definition of nuclear pharmacy to regulations affecting radiopharmaceuticals, radiolabeled antibodies, and blood components, and is divided into sections by major organ systems.

The text contains a well-presented, easily understood balance of basic principles, practice, and clinical use. It is written in a pragmatic, appealing style and from a practitioner's point of view, as indicated by a statement that I especially appreciated: "Because the Becquerel and other proposed units of the international system (SI units) are not widely used, this book retains the units currently employed (i.e., curie, millicurie, and microcurie)."

The text is also adequately referenced and contains appendices with a wealth of practical information. It is an excellent, reasonably priced, introductory text for nuclear pharmacy students, nuclear medicine technology students, residents in training, and physicians entering nuclear medicine practice.

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