Each chapter consists of a scan finding or heading that is further divided into common, uncommon, and rare subheadings followed by lists of diseases; or a malady is described in the subheading that is further divided into more specific diseases. Where appropriate, the subheading is divided according to functional findings (such as, L. Ejection fraction-effect of interventions on exercised-induced changes), or specific anatomical abnormalities of uptake (such as, D. Doughnut pattern). The detail in these lists can be very helpful in the day-to-day interpretation of examinations for all practitioners.

An unusual and interesting feature is the one or more references that are appended to every condition listed. Only rarely does a disease or condition fail to have a recent pertinent reference and in some instances may contain 16 references (i.e., X. The radioactive iodine uptake test). Over 2,500 references are included in this volume and are stated by the authors to be as recent as mid 1983. In many instances an author's more recent pertinent article on the subject in question may be cited, as opposed to citing the original article, so long as the original article is referenced in the more recent publication. As an example, Dr. J. Conway's article on the effectiveness of radionuclide cystography in detecting vesicoureteral reflux, published in 1976, is cited instead of the original article published in 1972. The citations appear to be pertinent to the day-to-day interpretation of difficult examinations and speed the ease with which the literature can be searched in order to solve acute practical problems. The references are generally located after a major chapter (such as, Chapter 16, "Thyroid") or after a group of chapters (such as, Part I "Cardiovascular System"). Thus, this volume is also of great value as an indexed bibliography for a literature search. It is this excellent format of the comprehensive lists of diseases followed by the numerous references that will be of great value to anyone in nuclear medicine. The authors state that they avoided referring to any review articles that did not provide an original source. In most cases the references can be rapidly located, as the sources are readily found in most medical libraries. This is not always true, but those references which were located in obscure or difficult to find journals appear to be minimal in number. As an example, reference is made to a German article (in the original language) but two other more easily found references are also included.

My major criticism of the book has to do with the book itself. My volume inserts eight pages of the central nervous system references after the first three (of 11) pages of the thyroid references. Also, there are several instances of a major heading beginning at the very bottom of a page with the remainder of the gamut continued on the next page. Only a thin line separates each chapter and no use of icons, or just simply consistent locations on a page, are employed to aid the visual search for a chapter heading. This appears to be an economy move on the part of the publisher, and serves to make the listed condition more difficult to locate. Also, the quality of the paper used in the book is poorer than that found in most journals or reference books and is about equal to that of paper found in spiral-bound manuals.

The reader should be aware that this book is best both for the daily practitioner wishing to jog his memory for the possibilities of a scan finding as well as for the researcher wanting either a more complete differential diagnosis than offered in any single article or well selected references that can serve as the foundation for further study. This volume should be included in the library of every student or researcher of nuclear medicine as well as located in the interpretation area of the practitioner. This volume will be a useful addition to the libraries of all nuclear radiologist and nuclear medicine physicians, as well as any student in those fields. Researchers will find many areas of interest, enough to warrant purchasing the volume. The completeness of this book is outstanding. I have not yet recalled a finding that is not included herein. The modest price makes it a worthwhile purchase for all radiology libraries.

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ATLAS OF NUCLEAR MEDICINE ARTIFACTS AND VARIANTS

U. Yun Ryo, C. Bekerman, S. M. Pinsky, Chicago Year Book Medical Publishers, Inc., 1985, 220 pp, $59.50

This book is the third in the series that began with *Atlas of Normal Variants* by Dr. Theodore Keats and *Atlas of Computed Tomography Variants* by Dr. Kuhns. This one adds "artifacts" to the title, reflecting the importance of artifacts in nuclear medicine and the part they play in mimicking disease. The authors also stress that in nuclear medicine the variants are not only anatomical, but also physiological.

The atlas contains 11 chapters, starting with "Technical Artifacts." Chapters 2 through 10 are related to systems and organs, namely, about the (a) brain; (b) thyroid; (c) lungs; (d) heart; (e) liver and spleen; (f) hepatobiliary system; (g) kidneys and abdomen; (h) vascular system; and (i) skeletal system. The eleventh chapter discusses gallium-67 scans. The book is indeed an atlas with acceptable size images followed by expanded captions. The quality of the images is generally good, with only an occasional exception. The layout of the book is generally good and I found the atlas very valuable. Some of the examples of the artifacts and variants are the run-of-the-mill type that a nuclear physician comes across every day, but appreciates as references in print; some other examples are exotic and will always be valued by many in the nuclear medicine practice. I was particularly impressed when the authors used drawings and phantom results to explain some of the artifacts; I only wish that they had included more of these. Their explanation of the mechanism of spatial distortion of the pinhole image and the problem of using markers with a pinhole collimator is an example of the authors' good use of line drawings for explanation. Similarly, the "hot stripe" in the liver scan from small angle scattering of photons by the breast is well demonstrated by a phantom study.

The examples in this atlas of artifacts and normal variants reflect the experience in nuclear medicine to date. For example, the chapter on the liver and spleen is excellent, with several examples of variations of normal anatomy and varied artifacts collected over years of experience with this imaging modality, including single photon emission computed tomography scanning of the liver and spleen. The chapter on the lung follows closely in quality, with extensive examples of the

effect of the position of the patient and variations of anatomy and physiology as well as artifacts. The chapters on the skeletal system, brain, and gallium scans are also quite comprehensive and reflect the extensive experience of nuclear medicine in these fields. What are not covered as well as they could have been are certain aspects of thyroid scanning, for example, radioiodine-131 in thyroid cancer and metastasis. The chapter on the heart could have included some first-pass studies; the fairly complete section on thallium-201 imaging, however, makes up for some of the chapter's deficiencies. Gastrointestinal bleed study is common in most nuclear medicine departments today, but the book includes only one such case. The section on the kidney provides common and also rare examples of the anatomic variations but it is not as encompassing in other variants and artifacts.

I also question the need for the chapter on technical artifacts, since several other images in other chapters also result from technical artifacts. I would prefer that each chapter devoted to a system or an organ be divided into sections on, for example, technical artifacts, radiopharmaceutical problems, patient positioning, anatomic variations, and physiological variations, to make the book easier to follow and also more comprehensive. Likewise, the figure legends could have been prepared in a more uniform style to make the book more usable as a quick reference. For example, a very short title of the illustration could be followed by such subheadings as "findings," "explanation"(of that artifact or variant), "how to avoid" (the occurrence of that artifact), and "references" or "acknowledgments." The authors may want to consider some of these refinements in preparing their second edition, which undoubtedly should also cover artifacts and variants encountered in the newer tests such as indium-lll leukocyte studies as well as discuss computer artifacts during the creation of subtraction, functional and parametric images.

I highly recommend this book for all those involved in nuclear medicine, in particular physicians in practice, residents in training, and technologists. It would make a good addition to one's quick-reference, daily-use library. The authors are to be commended not only for preparing this atlas, which fills a void in the field of nuclear medicine, but for doing it so excellently.

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PHYSICAL PRINCIPLES AND CLINICAL APPLICATIONS OF NUCLEAR MAGNETIC RESONANCE.

RA. Lerski, Ed. London, Hospital Physicists' Association, 1985, 142 pp, £24.00

The uninitiated in the principles and theory of NMR imaging probably seek a short, concise, accurate but easy to read book on the basics with the idea of "getting up to speed" quickly. Dr. Lerski, through the Hospital Physicists' Association, has compiled seven chapters on the basic physics and instrumentation relating to nuclear magnetic resonance (NMR) and some of the clinical applications and a closing chapter listing NMR references covering 12 topics.

Holding this small (142 pages) book, one is led to think it can be understood in a short reading session. For the mathematically adept in electromagnetism, the book is simple; for others, the book is less informative. The audience was intended to be physicists primarily. Scientists/physicians who can wade through the math with some understanding will learn a great deal because the meat of the mathematical relationships relating to NMR are briefly and clearly described.

There are pearls of understanding (basic facts that are easy to remember) scattered throughout the text but one must read to find them. Once highlighted they make nice references.

The two clinical chapters are brief and illustrate the great interest in NMR imaging and spectroscopy. For the physicist/scientist these chapters lay a foundation for understanding the magnitude of the clinical interest. For the physician, these chapters are very brief and perhaps already outdated. Certainly the current medical NMR literature must be used to keep up with the latest trends in clinical uses of NMR.

In summary, the eleven contributors including the editor are to be congratulated for assembling a brief text on NMR primarily targeted to the physicist/scientist. As a reference book, the text is excellent for listing those mathematical relationships which describe the NMR phenomenon. The book is not however the best on the market for a clear "picture" of what NMR is all about. The illustrations are good but not unique in describing the NMR phenomenon. The book is reasonably priced and a good reference investment.

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