

nology students, certain chapters, such as Obstetrics and Neonatology or the Ear, may not be directly relevant to daily practice. However, the organization of the text permits such sections to be skipped over without compromising the continuity of the material.

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Atlas of Clinical Nuclear Medicine

Ignac Fogelman and Michael Maisey, The C.V. Mosby Co., 1988, 950 pp., \$195.00.

The authors present a "comprehensive atlas" of clinical nuclear medicine studies. This clinical atlas contains over 3,000 illustrations, containing chapters on bone, thyroid, renal, brain, liver and spleen, lungs, and cardiac studies. There is an additional chapter of miscellaneous studies covering localization of infection and inflammation, localization of tumors, bone marrow imaging, lymphatic and lymph node imaging, gastrointestinal studies, intestinal studies, scrotal imaging, adrenal gland scanning, parathyroid gland localization, salivary gland scanning, and lacrimal drainage scanning.

Each chapter begins with very concise information or a table describing the radiopharmaceutical to be applied in studying each organ. This is followed immediately by normal scans of each study type to be discussed in the chapter. Normal variance and occasionally some image artifacts are also shown. Clinical cases are then presented encompassing a wide variety of disease presentations for each type of scan. Diagrams and tables are presented to add valuable information. Highlighted boxes indicate teaching points, describing a particularly important aspect relating to case presentations.

Although the chapters somewhat indi-

cate that they outline a comprehensive study by organ systems, they relate primarily to the most frequently performed procedures for that organ system. This text reflects the procedural preferences of the authors' department—presenting thyroid uptake studies done with perchlorate instead of iodine, many thallium scans performed with planar imaging instead of SPECT, a lack of a significant number of examples of renal studies performed with hippuran, etc. This text could be strengthened by providing more examples of SPECT imaging, primarily relating to thallium imaging, and clinical examples of brain imaging with IMP or HMPAO to bring the text up to current clinical applications.

Overall, this is an outstanding atlas. The selection of cases covers a diversity of diseases and has an adequate representation of example cases. All case studies and example photographs are of high quality and photographic reproduction is excellent. Additional figures, tables, diagrams, and images from other modalities supplement the case presentations.

Technologists and physicians alike should find this a useful reference in their department libraries for reviewing disease presentations for a variety of nuclear medicine procedures.

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Quality Assurance For Diagnostic Imaging Equipment: NCRP Report #99

National Council on Radiation Protection and Measurements, 1988, 250 pp., \$18.00.

NCRP Report #99 is a comprehensive document that attempts to cover the whole gamut of quality assurance and quality control issues in medical imaging. This report matches the format of

most other NCRP reports except that it is somewhat thicker and attempts to focus on several imaging modalities rather than one.

Despite the title, the first five chapters are not directed at imaging equipment but address rather more general aspects of quality assurance. The fifth chapter is particularly valuable in that it directs its attention towards the management of personnel activities. Several examples are provided, which should call the attention of department managers and imaging physicians to aspects of quality assurance outside of the normally accepted realm of equipment performance.

If any criticism is to be levelled at these initial chapters, it is that they consistently use radiography as the imaging modality for purposes of example. Later chapters concentrate on other imaging modalities, but it is manifestly evident that the greatest attention has been paid to radiography.

This reviewer does not feel competent to comment in detail on those chapters dealing specifically with radiography, CT, ultrasound, and MRI. In any case, readers of the *Journal of Nuclear Medicine Technology* are more likely to be interested in Chapter 16, which deals with nuclear medicine equipment.

Here they will face disappointment. Despite its publication date of December 30th, 1988, the latest dates of any references are 1986 and these are few and far between. The material is sadly out of date and incomplete. References are made to count adding and count skimming techniques for scintillation camera uniformity correction. Such systems were obsolete well before 1988. It is ironic that in the section on SPECT, there is the statement that "in the rapidly changing field of SPECT, the user should keep abreast of the current literature." This is probably the best advice contained in that chapter. What a pity that the NCRP failed to follow its own advice.

Another example of out-of-date-ness appears on page 141 where there

is a reference to a computer program that maps "image points which exceed the $\pm 7\%$ limits" of the camera uniformity flood. It is fairly safe to state that most of today's cameras can perform well within those limits, and 7% changes are only likely to occur when a camera is performing very poorly. In the same section, the report recommends placing a point source at a distance of 4 field of view diameters and collecting 1 million counts for intrinsic floods. Most other quality control protocols recommend 5 field of view diameters and at least 2 million counts.

A comprehensive list of quality control procedures for all modalities is included in an appendix. This, too, is disappointing and even confusing. What, for example, is meant by a "minimum of 50 channels per FWHM" for the energy resolution of a scintillation camera? Surely this should be quoted in terms of more meaningful units than "channels." It may, in any case, be a redundant procedure since it is virtually impossible to make such measurements on most modern cameras. As an aside on the subject of units, it is gratifying to note that the NCRP adopted the international system of units (SI) when it published Report #82 in 1985.

In summary, I found the section relating to nuclear medicine to be unacceptably out of date and incomplete. The first few chapters dealing with the more general aspects of quality assurance are useful, and, if they serve to stimulate nuclear medicine personnel into reviewing the overall performance of their departments, then the report is well worth its \$18.00 price. One quotation from Chapter 5 serves as a good definition of quality assurance. Quality assurance is "a comprehensive management tool designed to assist the imaging physician in providing diagnostic service of the greatest possible benefit to the patient at the least possible cost measured in terms of patient irradiation, discomfort, inconvenience and cost." As long as we keep the welfare of the patients first and fore-

most in our quality assurance activities, we shall be performing a valuable diagnostic service.

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Nuclear Medicine Annual 1988

Leonard Freeman, and Heidi Weismann, Editors, Raven Press, 1988, 352 pp., \$95.50

The *Nuclear Medicine Annual 1988* is the ninth in this series of comprehensive reviews on the use of radionuclides in medicine. The editors have once again chosen topics with current clinical relevance and the authors have provided detailed discussions of the topics accompanied by comprehensive, up-to-date bibliographies for useful reference.

The first article "The Bone Scan and Breast Cancer" by Ignac Fogelman and Robert Coleman is perhaps the most comprehensive review on this important topic that I have ever seen. It contains 102 references to support the extensive nature of the report.

"Current Status of SPECT Abnormal Imaging" by Ronald L. Van Heertum offers both the technical aspects of SPECT and the practical applications of abdominal imaging and cites 157 references. Emphasis is placed on blood-pool SPECT for the characterization of tumors and the use of SPECT for imaging infection.

One of the less commonly performed studies in nuclear medicine is "Esophageal Transit Scintigraphy" (ETS). Authors Herbert A. Klein and Arnold Wald discuss the physiology of esophageal motility, the quantitative methods for analysis, and analysis by pattern recognition. There is a review of the technique of condensed dynamic images (CDIs), how they are derived and analyzed. The pitfalls of ETS also are

reviewed.

There follows a superb review of the topic of "Captopril Scintigraphy" by George N. Sfakianakis and colleagues. They review the current understanding of renovascular hypertension (RVH) with emphasis on the pathophysiology of the angiotensin converting-enzyme inhibitors. Their comprehensive knowledge of captopril renography is evidenced by the detailed discussion of their clinical experience. They conclude that angiography remains the standard for documenting renal artery stenosis (RAS) but captopril scintigraphy has the unique advantage of diagnosing renal ischemia from RAS (60%–90%) and has correlated well with the results of therapy or surgery for RVH. Thus, captopril scintigraphy may prove to be a powerful noninvasive technique to screen patients for angiography, percutaneous transluminal renal angioplasty, or surgery. My only criticism of this section is the extensive use of abbreviations.

The use of radiolabeled monoclonal antibodies continues to loom upon the horizon and Andrew M. Keenan's section will keep you up-to-date with the latest in this technology. Included are discussions of historical interest, the basics of immunology, hybridoma production technology, and radiolabeling procedures in the nuclear medicine laboratory. The pharmacokinetics of radiolabeled antibodies are discussed. Also, animal and human studies are detailed. The comprehensive nature of this update is exemplified by its 164 references.

The section on "...Diagnosis and Therapy of Osteoporosis" by Edward B. Silberstein follows a review of this topic in *Nuclear Medicine Annual 1986*. This supplement was deemed necessary because of the controversy surrounding this topic and the continuing evolution of data. Issues of comparisons with nuclear techniques versus quantitative computed tomography, precision, screening, and indications are well covered.

Speaking of comprehensive reviews, Richard P. Spencer's section on