

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In summary, I found the section relating to nuclear medicine to be unacceptably out of date and incomplete.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

“Changes in Functional Imaging with Aging, Part 2” includes 213 references. His review includes discussions on the impact of aging on renal function, splenic changes, the central nervous system, the endocrine system, especially thyroid function, and the lungs.

Finally, there is an update on “Quantitative Assessment of Hepatobiliary Scin-

tigraphy” by Shakuntala Krishnamurthy and Gerbail T. Krishnamurthy, whose expertise in this area is well established. Their discussion includes the biokinetics involved, cholecystinin-like hormones, scintigraphic patterns, normal and abnormal, and factors which control gallbladder dynamics.

In conclusion, *Nuclear Medicine An-*

*nual 1988* is well worth the effort in reading and will serve as a reference source for years to come.

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