## MAGNETIC RESONANCE ANNUAL 1985.

*H.Y. Kressel. New York, Raven Press, 1984, 324 pp, $49.50*

The first edition of the *Magnetic Resonance Annual 1985* seems to parallel similar efforts of the *Nuclear Medicine Annual*, *Seminars in Nuclear Medicine*, *Seminars in Roentgenology*, and *The Radiologic Clinics of North America*. The similarities include prompt publication of selected topics representing state-of-the-art reviews with minimal scientific peer review. The unique feature of this annual is that it appears to be the first, and so far only, annual review dedicated solely to magnetic resonance. It is likely that future issues of the other parallel publications will eventually have issues dedicated to magnetic resonance imaging and spectroscopy.

On the other hand, one might wonder why an additional annual would be needed. We certainly have an abundance of meeting transactions, society journals, and the four abovementioned medical imaging annuals, seminars, and clinics. On the other hand, an annual dedicated to magnetic resonance developments is certainly an intriguing idea and a premier editorial advisory board including internationally visible and productive investigators has been assembled by Dr. Kressel. The editorial advisory board represents institutions in the United States, Japan, England, and the Netherlands. This international scope helps to assure a wide range of topics from multiple institutions.

The contributors to the first edition represent basic scientists and clinical investigators with broad experience with multiple different kinds of magnetic resonance instrumentation. A scope of topics in this issue includes physical principles; site planning; contrast agents; clinical results in the brain, cardiovascular system, and genitourinary tract; a review of phosphorus nuclear magnetic resonance spectroscopy and imaging with permanent magnet systems and high strength magnetic field systems.

The first issue is limited in scope and somewhat limited in depth. The ten specific topics each provide useful data in this growing field. Therefore, I am very pleased to recommend this new *Magnetic Resonance Annual* and, in particular, the 1985 version as a worthy addition to the literature and a useful source of important and current data for every practicing magnetic resonance basic scientist and medical imaging physician.

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## QUALITY CONTROL OF NUCLEAR MEDICINE INSTRUMENTATION.
## IAEA TECDOC-317

*paper, Vienna International Atomic Energy Agency, 1984, 211 pp*

This publication is the product of the work of two Advisory Groups convened by the International Atomic Energy Agency. An earlier version, without actual test protocols, was developed in 1979 and, in 1982, revised to include these. The present published version has refined the recommended test schedules and protocols.

The documents provide a brief overview of some general considerations relating to quality control before focusing on specific types of nuclear medicine instrumentation. The advisory groups have seen fit to include aspects of product selection and acquisition as well as acceptance and reference testing as integral parts of quality control.

Specific nuclear medicine instrumentation included in the publication's coverage are radionuclide dose calibrators, manual and automatic gamma-ray counting systems (in vitro), single and multiprobe counting system (in vivo), rectilinear scanners, and scintillation cameras. Each type of instrument is provided its own chapter and these are well-organized. Chapters have four sections including an introduction, a recommended test schedule, an extensive listing of acceptance and reference test protocols, and a listing of operational checks. In describing the various tests and checks, the document gives rationale for the test; at least one procedure and, many times, one or more alternative methods; some typical observations to be expected; information on the interpretation of results; and a conclusion which often suggests what types of records should be maintained. The inclusion of material on rectilinear scanners will be of limited value to U.S. users but the larger purpose of the document was to assist those in developing countries. It has achieved this goal and has been found very effective in training programs in these areas. The recommendations generally are in agreement with those promoted in the U.S. and the publication could be of significant value to any nuclear medicine unit committed to implementation of a strong quality assurance program. The document is not written in a highly technical manner and could be utilized in nuclear medicine technology training programs effectively.

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## DOPPLER ECHOCARDIOGRAPHY.

*S.J. Goldberg, H.D. Allen, G.R. Marx, C.J. Flinn. Philadelphia, Lea & Febiger, 1985, $30.00*

## DOPPLER ULTRASOUND IN CARDIOLOGY. Physical Principles and Clinical Applications, 2nd Edition.

*L. Hatle, B. Angelsen. Philadelphia, Lea & Febiger, 1985, 331 pp, $30.00*

Echocardiography has undergone significant evolution since the first faint to and fro movement of dots seen on an A-mode echocardiogram was recognized as representations of the mitral leaflets. During the last decade, M-mode echocardiograms have contributed tremendously toward our under-

standing of cardiac physiology and have helped to explain some of the conditions that in the "pre-echo" era were enigmas. The routine diagnosis of entities such as mitral valve prolapse and asymmetric septal hypertrophy would be much more difficult without echocardiography, and some conditions that previously required full heart catheterization can now be diagnosed and quantitated with high degrees of reliability with this noninvasive tool.

As the name might imply, two-dimensional echocardiography added a new dimension and allowed the clinician to see the functioning heart as it beats within the chest, rather than an "ice pick" view depicted by the M-mode graphics. The M-mode and 2-dimensional techniques complement each other and the combined examination is in many respects much more useful than either part alone. Both M-mode and 2-dimensional echocardiography use time to measure distance, and the time taken for the ultrasound wave front to reach its target and be reflected back to the transducer is represented on a calibrated centimeter scale.

It was Professor Christian Johann Doppler, an Austrian professor of mathematics, who in 1842, noted the apparent change in the frequency of waves as the relative position of their source and the observer approach or move away from each other. Although Doppler made this observation on the basis of astronomical phenomena, it is much more obvious now as the apparent change in pitch of an automobile horn as a car approaches the listener and passes him. When used as a clinical tool, the source and observer are replaced by a single transducer, and the frequency shift is produced by movement of the reflecting medium. Detecting frequency shifts using the Doppler principle, when properly applied, can add significant additional information to the routine M-mode and two-dimensional echocardiographic examination. Blood flow velocity measurements can be made rapidly, and lesions that could only be indirectly assessed through conventional echocardiography can be now quantitated with the help of this new clinical tool. There is confidence in the assumption that cardiac output, shunt quantification, and regurgitant fraction determinations will be routinely accomplished in most centers using Doppler ultrasound techniques in the near future.

The two volumes reviewed cover similar material. The larger book, *Doppler Ultrasound in Cardiology*, is a product of the Section of Cardiology at the University of Trondhaim in Norway. It is a somewhat more theoretical and a much more in-depth presentation of the subject. The physics of Doppler ultrasound is covered in a semi-quantitative way, and although some of that material may go beyond the grasp of many clinicians, nevertheless, it is nice to know that it is readily available. The book is provided with an appropriate abundance of illustrative material, which is certainly essential in dealing with a field that is just beginning to acquire its appropriate respect in the medical community. The book is divided into seven chapters: The first three encompass the introduction, and introduces the physics of blood flow and blood velocity measurements using the Doppler effect. They provide the reader with ample background information. Chapters four and five cover the normal and abnormal velocity patterns and constitute the most important sections of the book, which are then followed by a brief discussion of measurements of high velocities using pulsed Doppler. Additionally, techniques for cardiac output are addressed in the final chapter. Many of the more important and some obscure references are cited, and the index is well done with adequate citations.

The smaller volume, *Doppler Echocardiography*, a product of the Pediatric Cardiology Department at the University of Arizona, is about half the size of the larger text. It should not be considered a book of pediatric applications of Doppler Ultrasound, but rather a guide to most of the important Doppler applications in children and adults. The book is somewhat easier to read than is the Hatle/Angelsen work. The introductory chapter concerning Doppler physics is more descriptive and might appeal to a less mathematically inclined reader. The book is well organized and touches on most of the important abnormalities where Doppler echocardiography provides useful information. Chapter three addresses the performance of a Doppler examination in the normal individual. Chapters four and five address flow disturbance and flow computations. The final four chapters are the most interesting from a clinical standpoint, and address shunts, pressures and valve areas. The reference and the index are adequate.

If I were selecting a reference book to be included in the adult Doppler laboratory library, and could only choose one, it would clearly be the Hatle/Angelsen book; if I knew very little about Doppler ultrasound and wanted a quick overview of the types of studies, and where the technique might fit in the full non-invasive cardiologic evaluation of patients, I would probably prefer the Goldberg/Allen/Marx/Flinn book, although a good case could be made for selecting the larger volume in that setting also. Cardiologists involved with a significant amount of congenital heart disease might prefer the smaller book. Lea & Febiger, the publisher of both of these books, has given us a difficult choice: In the best of all possible worlds, a reader would not have to make the selection and would simply place both of these well written and useful books on the shelf of his personal library.

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