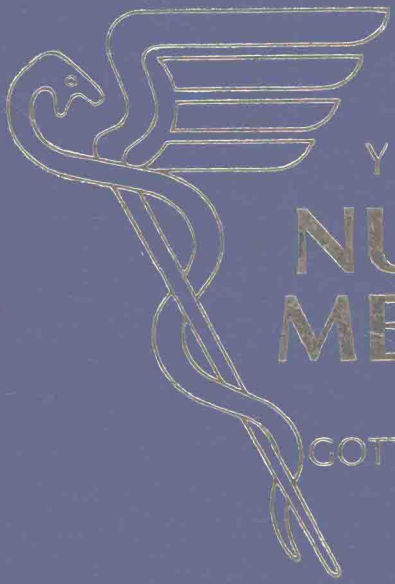

1981 YEAR BOOK OF NUCLEAR MEDICINE®

HOFFER
GOTTSCHALK / ZARET

The YEAR BOOK of

Nuclear Medicine

1981

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YEAR BOOK MEDICAL PUBLISHERS, INC.

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Introduction

The first volume of the YEAR BOOK OF NUCLEAR MEDICINE appeared in 1966. For the next 15 years, Jim Quinn virtually single-handedly assembled, reviewed and selected the articles that appeared in each edition. His comments were terse, sometimes biting, but always honest. While the initial task of reviewing the world's literature in nuclear medicine was probably modest, it became progressively more arduous. Jim's life was burdened by numerous academic and political responsibilities as well as progressing medical problems. Despite these obstacles, Jim continued to produce, year after year, a concise yet insightful review of the world of nuclear medicine. He was actively involved in this task up until the last month of his life.

When the responsibility for this volume shifted to me, two things became obvious. First, Jim's efforts with regard to the YEAR BOOK had become superhuman, especially in the past few years. Second, the field of nuclear medicine had expanded to such an extent that no one person could legitimately consider himself an expert in the entire field any longer. I was fortunate to have two colleagues, Alex Gottschalk and Barry Zaret, who agreed to lend their expertise and share the responsibility for selecting and commenting on the articles that appear in the current volume. Thus, the YEAR BOOK has become a shared project. The book has changed in other ways as well. The first volume reviewed 12 articles related to "The Heart and Great Vessels"; more than 60 articles are reviewed in the current "Cardiovascular System" chapter. The first chapter on bone included 16 articles, only 4 of which related to imaging; the current chapter "The Bones, Joints, and Muscles" includes about 40 articles, most of which are image oriented. On the other hand, the "Central Nervous System" chapter has shrunk from 38 articles to 9.

While some things have changed in the YEAR BOOK OF NUCLEAR MEDICINE, other things have not. Jim noted in

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his original editor's comment that it was sometimes difficult to assign articles to specific chapters because they overlapped two or more subjects. The problem persists. Jim also noted, "Despite precautions, good articles are sometimes missed. I would appreciate knowing of any such incidents or, indeed, any criticism of this book's format or content. Being a new editor of a . . . YEAR BOOK is something less than a position of editorial perfection." These comments are as relevant today as they were in 1966.

In this and future volumes, I will attempt to be true to the tradition that Jim established. The *Talmud* states:

When a man departs this world, neither silver nor gold nor precious stones accompany him; he is remembered only for his love of learning and his good deeds. Happy is the man who is rich in good deeds, for he shall be honored in life, and be remembered long afterwards for his goodness.

While these thoughts were expressed many centuries ago by sages who had never been to Ireland, Pittsburgh, or Chicago, I am sure they were thinking of the likes of Jim. I hope the YEAR BOOK OF NUCLEAR MEDICINE will remain a part of his living legacy.

PAUL B. HOFFER, M.D.

Acceptance Address

DISTINGUISHED SERVICE AWARD OF THE
SOCIETY OF NUCLEAR MEDICINE

MARIE QUINN, M.D.

Perhaps no one's disappointment here today is as keen as mine. We all would have much preferred to see Jim. However, such was not to be, and so I am grateful for the opportunity to be with you today as we honor him.

In the acceptance of this award, I will address myself only to Jim, the man I knew and loved. The award in and of itself attests to his professional achievements, and I am convinced you probably know and understand them better than I do.

A wise old sage once said, "A long life is not necessarily a good life but a good life is long enough." And so it was with Jim. Gone, however, is the gentle, brilliant Jim who sought always to add a little laughter, a little joy, to our world of illness and worry.

If some of you still miss him, worry not, because I have concluded that we grieve to the measure to which we have loved—and I know Jim was loved by many. What Jim and I lacked in length of our marriage we certainly experienced in height. I am full of fond and loving memories of those brief years.

There is no doubt in my mind that he was one of the brightest, funniest, and kindest human beings who has crossed the path of my earthly journey—and I consider it both a joy and a privilege to have been his wife. So when he died 58 days ago, I not only lost my husband and lover, but I also lost the dearest and most loyal friend I have ever known. I would not be so brazen as to say that there is no marriage as marvelous as ours. But I would be so brazen as to say there was none better.

Jim always told me how really insignificant recognition in this life is as long as his Creator approved of his efforts. And perhaps Thomas Gray (one of Jim's favorite poets), in what Jim always referred to as his "graveyard poem," summed up Jim's feelings best:

Full many a gem of purest ray serene,
The dark unfathom'd caves of ocean bear:
Full many a flower is born to blush unseen,
And waste its sweetness on the desert air.

I know his feelings about personal achievements to be a fact since only three years after our marriage did I accidentally stumble upon his curriculum vitae, and I was truly amazed at the contents. His only comment was that it was to little avail if it did not help mankind.

Jim was fully aware of his impending death, and together we discussed it at length. He came to accept it with courage and graciousness. He was a deeply religious man, which few people appreciated, and he faced his death as he tackled his life, with courage and dignity. He requested only that he be allowed to die in his king-size bed. Together, we planned his funeral services, and he insisted it be joyous, full of hope for his fellow man, and always for the greater glory of God. There is more I could share with you, but I am sure you understand when I tell you that it is too personal and precious to share with anyone.

And finally, in accepting this award you have bestowed on my beloved husband, I do so on behalf of God who created him, his parents who raised him, Belmont Abbey and Bowman Gray who played such a dynamic role in his education, and last—but not least—you, his many colleagues, who encouraged and supported him through good and, more recently, some pretty rocky times.

In conclusion, as my Jimbo would say to you:

May the road rise to meet you.
May the wind be always at your back.
May the sun shine warm upon your face.
May the rains fall soft upon your fields.
And until we meet again, May God hold
you in the palm of His hand.

Thank you.

June 24, 1980.

1. Cardiovascular System

Nuclear Cardiology: Overview and Current Clinical Considerations

BARRY L. ZARET, M.D.

Associate Professor of Medicine and Diagnostic Radiology, Chief, Section of Cardiology, Yale University School of Medicine

Over the past five years there has been a dramatic expansion in the development and application of nuclear techniques designed specifically for the study of cardiac disease. A simple tally of the continually rising number of abstracts dealing with nuclear cardiology currently presented at the major nuclear medicine and cardiology national meetings provides an immediate awareness of the impact of this new discipline. Currently there appear to be two major indications for clinical utilization of nuclear cardiology techniques. These are : (1) to establish a diagnosis and (2) to define or quantify the extent of known disease. The second indication involves a broad-based functional assessment that has implications concerning therapy, prognosis, and various other factors. At the present time in the development of the field, it is worthwhile briefly to examine specific aspects of nuclear cardiology with a view toward current applicability, appropriate utilization, and future directions. This short review is not meant to be comprehensive; rather, it only will highlight selected procedures used in the assessment of patients.

Cardiac Function Studies

Presently, cardiac function studies probably are performed with the greatest frequency of all nuclear cardiology procedures. The methodology involved has been vali-

dated against a "gold standard" of contrast left ventricular angiography in a number of laboratories. Correlations generally have been excellent. The methods are reproducible and the measurements can be made at an acceptably low variability. For global performance, quantification is readily obtained. Therefore, analysis is not dependent on an individual subjective qualitative visual assessment. In general, these techniques have application to many forms of cardiac pathology, and this represents an important consideration concerning their wide use. Clearly, an appreciation of ventricular performance is basic to the understanding and treatment of all types of acquired and congenital heart disease. Furthermore, cardiac performance studies appear to be the most suitable techniques for sequential long-term assessment. This provides the clinician with meaningful quantitative data over a protracted period. Such data clearly are relevant to management and prognosis. Many examples of the clinical utility of these studies exist. One such evaluation involves the utilization of ventricular performance studies for individualization of therapy with cardiotoxic agents such as doxorubicin.[1] This agent is routinely used in the treatment of malignancy. High-dose therapy (which is beneficial with respect to antitumor response) is often associated with the development of irreversible cardiomyopathy. Sequential assessment with ventricular function studies, using guidelines developed on the basis of detailed evaluation, allows tailoring of therapy such that high doses of the drug can be administered safely and preclinical manifestations of ventricular dysfunction can be detected prior to major cardiovascular deterioration.

In association with exercise stress, ventricular function studies can be used both to diagnose and functionally assess patients with coronary artery disease.[2, 3] In many laboratories, it has been noted that exercise left ventricular function studies are a highly sensitive, although somewhat less specific, means of establishing a diagnosis short of coronary arteriography. Future clinical application may involve patients with valvular heart disease as well. It is evident from preliminary studies that abnormalities in exercise ventricular performance can be detected routinely in subsets of patients with aortic regurgitation. With future

experience, it may be possible to utilize such an approach to decide on the optimal time for surgical therapy, irrespective of the presence of symptoms. In short, the application of ventricular performance studies to patients with cardiac disease is broad. It will require future detailed assessment to determine which particular approaches have sustained clinical relevance, which will remain in the realm of predominant investigative interest, and which will be transient fads.

As is generally appreciated, ventricular performance studies can be performed in one of two ways. These are the first-pass quantitative radionuclide angiocardiogram technique, in which the first transit of an intravenous bolus through the central circulation is assessed, and the multigated equilibrium study, in which physiologic signals are introduced into the static computerized imaging procedure. Both techniques have been utilized clinically and each has been employed in many reports appearing in the literature over the past several years. Frequently, questions arise as to which technique is most appropriate. There is no single or simple answer to these questions. The arguments have parallels in the debates of the previous decade concerning the best catheter approach to coronary arteriography. It is clear that each nuclear technique has specific benefits and limitations. Appreciation of these factors, consideration of the patient population under study and the specific training of the people in the laboratory all impact on decisions concerning which technique should be used.

The first-pass technique can be performed very rapidly. The patient can pass through the laboratory in a matter of minutes for a simple resting study. This allows definition of rapidly changing states and may be optimal for the ill patient who cannot remain in a supine position for long periods. It would appear that this technique is also the best approach to upright exercise in patients who cannot exercise in the supine position. Analysis is made of individual cardiac chambers without potential contamination from activity in the adjacent chambers. It is the best noninvasive means of assessing the presence of intracardiac shunts and quantifying their magnitude. This technique does, however, have substantial limitations. An individual radioisotope injection is required for each study. Regional wall mo-

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