

JNM FOUNDING EDITOR LOOKS TO FUTURE OF NUCLEAR MEDICINE AND MEDICAL EDUCATION

George E. Thoma, Jr., MD, founding editor of *The Journal of Nuclear Medicine (JNM)*, has recently begun a one-year sabbatical with the World Health Organization in Geneva, Switzerland, to study the major medical schools in Europe.

As a member of the Liaison Committee of Medical Education, the accrediting body for North American Medical Schools, Dr. Thoma said that "it has become patently evident that most of our medical schools do a less than adequate job in teaching ambulatory health care." He has spent the past few years interviewing medical, nursing, and allied health students in the United States about the strengths and weaknesses of their educational programs, and he plans to discover whether the European systems offer better alternatives.

Dr. Thoma declined to give any specific opinions on nuclear medicine training programs because his administrative responsibilities at the St. Louis University Medical Center have precluded his taking an active role in nuclear medicine for the past 15 years.

Evolution of Nuclear Medicine

"I can keep up minimally with internal medicine, but that field is not growing exponentially as is nuclear medicine. You miss six months of nuclear medicine literature, and you're out of the game," said Dr. Thoma, who retired as vice president for the medical center earlier this year. [Robert M. Donati, MD, a member of The Society of Nuclear Medicine (SNM) and chairman of the American Board of Nuclear Medicine, has been appointed acting vice president for the medical center at St. Louis.]

Looking at nuclear medicine from a more distant vantage point, however, gives Dr. Thoma a distinctive view of the field's direction. "It's conceivable that nuclear medicine could evolve to include imaging that's not radionuclide imaging. I'm not advocating it; I'm just realizing how things tend to develop in medicine. When you look at the development of the technology today, and at how nuclear medicine lends its techniques to other areas, then delineating nuclear medicine procedures as strictly those that use radionuclides is a shallow basis of definition," he explained.

Dr. Thoma also said that the ideal role for nuclear medicine physicians involves active participation on the diagnostic team for each patient instead of simply performing procedures ordered by a referring physician.

Regarding the turf battles that have emerged in recent years, Dr. Thoma said, "Unfortunately, in the squeezing medical economy, those turf battles are going to get worse before they get better, and they're going to invade all areas of medicine—not just high-tech specialties."

"What worries me is that we may see the same trend in medicine that is now apparent in dentistry. Today, for example, over 50% of all orthodontia work is being performed by general practitioner dentists, who have taken one- or two-week refresher courses in orthodontia, instead of by trained and certified orthodontists," said Dr. Thoma.

The medical community is about a decade behind the dental field in the oversupply of practitioners, he noted. Access to hospital facilities will prevent this trend from taking hold in several areas, "but there is a great deal of concern about free-standing



George E. Thoma, Jr., MD

surgical and imaging centers," he added.

As a solution, Dr. Thoma advocates educating the public on the importance of credentialing. Specialty societies could play a valuable role in helping the public to become better informed consumers of health care, he added.

Polycythemia Patients

As a medical resident in 1948 at the St. Louis University Hospitals, Dr. Thoma read in the literature about a new phosphorus-32 treatment for patients with polycythemia. "The hematologist didn't know how to get it, and I found out that you couldn't just write a prescription for it. You had to be licensed," he said.

After a physicians course at the Oak Ridge Institute for Nuclear Studies (ORINS) and a short training period at Washington University, Dr. Thoma was qualified to receive phosphorus-32. He then established the

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Radioisotope Laboratory "literally in a closet" at St. Louis University's Firmin Desloge Hospital and began other work with radioiodine therapy for thyroid disease and localization of brain tumors with diiodofluorizine.

Sometime around 1960, the Radioisotope Laboratory became the Department of Nuclear Medicine, and Dr. Thoma continued to direct the program until 1968 when he became assistant vice president for the medical center. In the early 1960s, St. Louis University received a training grant in nuclear medicine from the

National Institutes of Health (NIH) of \$100,000 annually for three years.

"Eugene Saenger got one of the first training grants, and I wasn't going to let him outdo me in anything," said Dr. Thoma of his close friend and colleague of 30 years. Without the NIH grant, noted Dr. Thoma, nuclear medicine would have been very slow in developing at his institution.

"Back then we were part of the Department of Medicine, and our chairman was a great European professor who thought that atomic medicine was some kind of snake oil. Any attempt to get any budget out of him

would have been ridiculous!" he recalled.

The second major step at St. Louis was a grant from the US Public Health Service's Bureau of Radiological Health to study the effects of radioiodine treatment. Members of the medical community thought that radioiodine might cause cancer of the thyroid and/or leukemia, explained Dr. Thoma, but studies indicated that patients treated with surgery had higher incidences of cancer than those treated with radioiodine. Drs. Thoma and Saenger published a landmark paper reporting results of a longitudinal study that indicated no association of leukemia with radioiodine therapy (1).

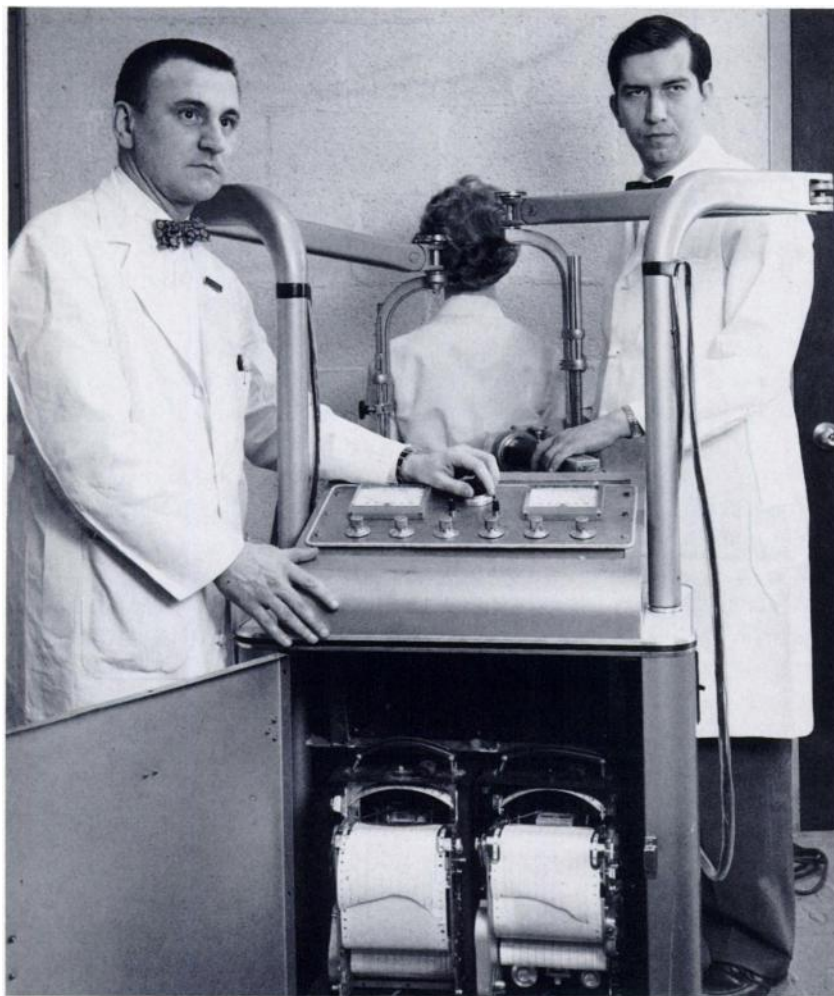
In addition, Dr. Thoma's group received funding in the early days to study the biologic effects of gamma radiation.

Serving as editor of *JNM* from 1958-1970, Dr. Thoma said that he envisioned from the start, when the journal was a quarterly that published six or seven papers in each issue, that it would grow into what it is today.

In the late 1950s, when Henry L. Jaffe, MD, was president of the SNM, several members discussed starting a journal but were concerned about the cost. "Finally, Henry said, 'Let's just do it, and if we run into trouble, I'll help out.' Jeff Holter offered to do the same," recalled Dr. Thoma. "I used to sit at the dining room table at 3:00 a.m. copyediting manuscripts. We didn't have any staff besides my secretary," he added.

Abolish Tenure

About the pressures today on investigators to publish results at a faster pace, Dr. Thoma pointed to the tenure/promotion system for fostering this atmosphere. "We ought to do away with tenure. I find very little need for tenure, particularly for clinical faculty," he said, noting that a number of professors at St. Louis University have voluntarily relin-



One of the first nuclear medicine renal scans was performed in the 1950s at St. Louis University by George E. Thoma, Jr., MD (left), and William Leightner, MD. The detectors over the patient's kidneys are picking up signals from an injection of hippuran. (Ed Meyer)



Eugene L. Saenger, MD

quished their tenure as an example to others in the clinical community.

The period of *de facto* tenure, ranging from five to seven years at most universities, is also not long enough for an assistant professor to demonstrate whether tenure should be granted, he added.

Dr. Thoma also served as chairman of the SNM Publications Committee for 10 years, and as president of the Central Chapter in 1964.

Henry N. Wellman, MD, current president of the Central Chapter, began his training under Drs. Thoma and Eugene L. Saenger, MD, an associate editor of the *JNM* when it was founded. "It was only 15 years after the atomic bombings in Japan, and a great number of things we take for granted today about radiation and dosimetry just weren't known then," said Dr. Wellman.

"My first formal introduction into things nuclear was taking one of Dr. Thoma's courses at St. Louis University in the fall of 1960," recalled Dr. Wellman. As a medical student, Dr. Wellman carried out some of Dr. Thoma's research in developing a technique for placental localization.

By drawing a "tic-tac-toe" pattern on the abdomen of a pregnant woman

after an injection of iodine-131 albumin, the placenta could be located by determining which square had a similar number of counts as the heart. "It was 99% accurate, and one of the most frequently performed nuclear procedures in the late 1960s and early 1970s before the advent of ultrasound," said Dr. Wellman.

Detectors Were Geiger Counters

Nuclear medicine has advanced by several orders of magnitude since the early days of the journal, said Dr. Saenger. "The journal was founded in a much more naive time. The techniques were clumsy. Our detectors were all geiger counters. When we got the first scintillation crystal, we thought that was the greatest thing since sliced bread, and it was primitive. I used to calibrate my own iodine and phosphorus—we didn't have the soda fountain full of 29 different flavors of radiopharmaceuticals that we have today," he said.

Dr. Saenger is director of the E.L. Saenger Radioisotope Laboratory at the University Hospital in Cincinnati, a prominent institution in the development of the field of nuclear medicine. James G. Keriakes, PhD, a physicist in that laboratory, for example, was instrumental in establishing at the University of Cincinnati the first bachelor's degree program in nuclear medicine technology.

Dr. Saenger also served as the first president of the Society for Clinical Decision Making, and eventually established the *Journal of Clinical Decision Making*. The origin of these two entities traces back to his work on the SNM Efficacy Subcommittee.

"The other interesting journal in those days was *Nucleonics*," a commercial journal owned by McGraw-Hill in the late 1950s and early 1960s with articles on nuclear medicine, engineering, physics, and radiation biology. The *JNM* gradually usurped the position of *Nucleonics*, which no longer exists, noted Dr. Saenger.

Drs. Thoma and Saenger, working with Neil Wald, MD, also an associate editor of *JNM* when it was founded, wrote the articles that are used as a triage for radiation accidents (2-5). "They are the scientists associated with the first categorization of different acute radiation syndromes—from neurologic, gastrointestinal, to hematologic—correlated with pretty specific radiation exposures," said Dr. Wellman.

They also greatly influenced the formation of the Bureau of Radiological Health in the early 1960s [today the Center for Devices and Radiological Health of the US Food and Drug Administration]. Dr. Saenger was the primary consultant on radiation effects for the US armed services, and contributed a significant amount of basic work on biologic radiation dosimetry through the Defense Atomic Support Agency.

"Ultimately, Wald developed a chromosomal technique for looking at radiation effects from this work. He integrated the work of Thoma, Saenger, and Evans," noted Dr. Wellman. *(continued on page 1100)*



Francis Herbig, a physicist at St. Louis University, and a hematology fellow performing radiobiology experiments with a cobalt-60 facility to determine the hematologic effects of whole-body radiation on small animals in 1962.

(Peter Ferman Photographers)

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man. The late Titus C. Evans, PhD, a radiobiologist at the University of Iowa, was also an associate editor of the early *JNM*, which emerged from an energetic cluster of radiation pioneers (see box).

Drs. Saenger and Thoma have "tremendous organizational and administrative capabilities that amaze me," said Dr. Wellman. In addition to Dr. Saenger's nuclear medicine activities, he has been responsible for about 20 years for the local bond issues that raise money for his hospital.

Long-Range Planning

Dr. Thoma's accomplishments also went beyond the sphere of nuclear medicine. While serving as assistant vice president for planning at St. Louis University Medical Center, he developed a long-range plan that included major renovations of the medical school and area hospitals, as well as the establishment of new research centers and the School of Allied Health Professions.

This growth culminated in the Midtown Medical Center Redevelopment Corporation, a \$41.5-million redevelopment effort for the neighborhoods surrounding the medical center. Dr. Thoma serves as president of the corporation.

As thousands of city residents moved to the suburbs in the 1960s, Dr. Thoma was a vocal advocate of an active role for urban medical centers in the solution to health problems. He also believed that all medical students at St. Louis University should gain an understanding of underlying social causes of many illnesses (poverty, pollution, substandard housing), and he served on the AMA's Task Force on the Future Directions for Medical Education.

Looking Toward Year 2000

Next year, Dr. Thoma plans to return to St. Louis with new ideas from European medical schools, and re-

sume teaching and research activities.

"The whole medical education scene is going to change so much between now and the year 2000 that you won't recognize it. And so will the practice of medicine. I don't know how we're going to deliver health care in the 21st Century, but I do know that it's not going to be like we do it today, and it sure as hell is not going to be like we did in the 1960s. Those faculty people who are sitting around waiting for the 1960s to return are going to be sorely disappointed. It's not going to happen," said Dr. Thoma.

Similarly, Dr. Saenger refuses to dwell on the more economically stable eras of nuclear medicine. "A few years ago when X-ray CT became popular, everyone in nuclear medicine said, 'Hell, we might as well fold up,'" he noted.

Whenever nuclear medicine seems to be at a dead end, though, it picks up in new directions, said Dr. Saenger. At a recent medical meeting, for example, he was asked whether nuclear medicine physicians are developing functional studies of the skeleton. "I told him that I don't think we've even scratched the surface in this area. We haven't begun to do a lot of things," he stated.

Linda E. Ketchum

References

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THE FIRST JNM EDITORIAL BOARD

"Looking back on the history of nuclear medicine, the editorial board of the first issue of *JNM* was pretty fabulous," said George E. Thoma, Jr. MD, founding editor.

Associate Editors

*Titus C. Evans, PhD, was a radiobiologist from the University of Iowa, and was also very active in the Radiation Research Society.

Eugene L. Saenger, MD, established the radioisotope laboratory at the University of Cincinnati, and became an expert on radiation accidents.

Niel Wald, MD, set up the first radioisotope laboratory in Hiroshima and did hematologic studies for atomic bomb survivors. He also established the radiation health program at the University of Pittsburgh.

Consulting Editorial Board

Kenneth D.A. Allen, MD, of Denver, CO.

*Gould A. Andrews, MD, was chairman of the Medical Division at Oak Ridge from 1961-1975.

William H. Beierwaltes, MD, was physician-in-charge of nuclear medicine at the University of Michigan from 1952-1986. He devised a method for radioiodine therapy for thyroid carcinoma in the 1950s, and later developed I-131 NP-59 for imaging adrenal glands and I-131 MIBG for diagnosis and treatment of pheochromocytoma.

Benedict Cassen, PhD, was a physicist at UCLA. He developed the first medical directional gamma counter in 1949, and designed and built the first scintillation area (rectilinear) scanner in 1950.

Elliot Corday, PhD, was director of nuclear medicine at Cedars-Sinai in Los Angeles in the late 1940s. He did some of the very early work in studies of cardiac blood flow and ischemic myocardium, and was the first to adapt the Holter monitor for clinical use.

Charles L. Dunham, MD, was chief of the Division of Biology and Medicine at the Atomic Energy Commission.

Clement A. Finch, MD, was a hematologist and chairman of medicine at the University of Washington in Seattle.

*Norman J. Holter, MA, MS, was an independent inventor in Helena, MT, who developed the Holter monitor. He also served as a safety engineer on the Manhattan Project.

Howard B. Hunt, MD, was chairman of radiology at the University of Nebraska. His research interests covered radiotherapy and oncology.

E. Richard King, Capt. USN (MC), was chief of the radioisotope laboratory at the US Naval Hospital in Bethesda in the early 1950s. He wrote one of the first books, called *Atomic Medicine*, on the new specialty.

John H. Lawrence, MD, was director of the Donner Laboratory of Medical Physics and Biophysics from 1948-1972. He became the first to employ artificial radioactivity for therapeutic applications when he used phosphorus-32 to treat leukemia.

Warren K. Sinclair, PhD, was head of physics at M.D. Anderson in Houston, TX, and helped develop one of the first Co-60 teletherapy units. Today he is president of the NCRP.

Joseph Sternberg, MD, from the University of Montreal, was instrumental in establishing the World Federation of Nuclear Medicine and Biology.

*Shields Warren, MD, was a pathologist at New England Deaconess Hospital in Boston, and did early work in studying pathologic effects of radiation.

Robert E. Zipl, MD, was chief pathologist and head of nuclear medicine at the Miami Valley Hospital in Dayton, OH. He also used radiotracer techniques for research in NASA's Apollo space program, and did toxicology studies in animals on the products of the atomic bomb.

Managing Editor

Samuel N. Turiel later became the first executive director of the SNM.

*deceased