

PIONEER AWARD

ENGINEER AND CHEMIST HONORED FOR FOUR DECADES OF NUCLEAR PIONEERING

HE HAS DEVOTED OVER 40 years of his life to the field of nuclear medicine and although he is definitely a pioneer, C. Craig Harris, MS describes himself as a team player. "To me, the bottom line was to get the job done," he says. "I was never really concerned with getting recognition."

Recognition, however, is due Professor Harris. He will be awarded the 34th Georg Charles de Hevesy Nuclear Medicine Pioneer Award at the Society of Nuclear Medicine's Annual Meeting.

From the 1950s onward, Mr. Harris, formerly associate professor of radiology and now associate professor emeritus at Duke University Medical Center in Durham, North Carolina, was a driving force in nuclear medicine. He contributed to key advances in the design of nuclear imaging equipment and taught thousands of nuclear medicine professionals the ways of the field. He served as the president of the Society of Nuclear Medicine from 1968-1969 and helped found the Medical Internal Radiation Dose Committee.

Seminal Work at Oak Ridge

An electrical engineer with a Master's degree from the University of Tennessee, Mr. Harris began his career in nuclear instrumentation in 1950 at the Oak Ridge National Laboratory. Expecting a 3 month assignment, he wound up staying 17 years. An early success was organizing a physics laboratory at the Oak Ridge School of Reactor Technology for training the engineers who went on to design the world's first nuclear submarine, the *Nautilus*.

Mr. Harris joined the Physical Electronics Group at Oak Ridge and under Persa R. Bell, DSc, acquired an intimate understanding of the electronics of nu-

clear instrumentation. With his new-found mentor, Harris set about designing improved energy spectrometers, devices for recording data, servo-controlled scanners, and other instruments.

With Dr. Bell and Jack Francis, PhD, Mr. Harris built a prototype of a radiation measuring instrument in 1954 capable of recording energy-analyzed gamma rays from radioisotopes circulating in the human body. After co-authoring a paper on the development of the instrument, Mr. Harris re-engineered it and developed a version that was produced commercially.

"His contributions put smart physics into what a radioisotope scanner should be," says David Kuhl, MD, a professor and chief of the division of nuclear medicine at the University of Michigan Medical School.

"Craig introduced important pulse-height analysis that led to a remarkable decrease in the amount of scatter and creating a much clearer picture," says Dr. Kuhl. Mr. Harris, also experimenting with new collimators, built the first low-energy lead-foil collimator and helped design high-energy gold-focused collimators.

"We discovered that small lead collimators had insufficient stopping power to effectively directionalize gamma radiation from iodine-131, the principal isotope in use at the time," Mr. Harris says. With the marketing in the 1960s of technetium-99m and other low-energy gamma ray emitters, the lead-foil collimators became important for modern scanners.

"Craig was a dynamo," says Robert Rohrer, PhD, an Oak Ridge veteran and an emeritus physics and radiology professor at Emory University in Atlanta. "I owe a lot of my own experience to Craig Harris."



Nuclear Medicine Pioneer Award winner C. Craig Harris. The Society of Nuclear Medicine established the award in 1960 and changed the name in 1979 to honor Georg Charles de Hevesy, the Hungarian chemist who developed the radiotracer technique.

Arriving at Duke University Medical Center in 1967, Mr. Harris says his eagerness for a very active research career gave way to the practical necessities of building a clinical unit. He developed a one-year certificate training program for nuclear medicine technologists, which absorbed much of his time but allowed him the opportunity to teach. And he still managed to author dozens of scientific journal articles and book chapters.

Distinguished Educator

Mr. Harris has probably made his greatest impression on people as a teacher. "He was a wonderful teacher," says Sharon Hamblen, CNMT, assistant chief technologist at Duke and graduate of the program there. "He really believed in me," Ms. Hamblen says. "That
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extra reassurance made all the difference in the world."

Mr. Harris received the Distinguished Educator Award of the Society of Nuclear Medicine in 1985.

"Our nuclear medicine department is what it is today thanks to Craig and his hard work and devotion to seeing the job through," says Ed Coleman, PhD, Professor of Radiology and Director of the Nuclear Medicine Division at Duke, who worked closely with Mr. Harris for almost 15 years.

Mr. Harris handled the task of designing a new nuclear medicine service for Duke Hospital North in 1976. Three years later he took on added responsibilities as nuclear medicine scientist at the Durham Veterans Administration Medical Center. When Duke bought a positron emission tomograph in 1984, Mr. Harris volunteered to oversee the installation of the multimillion dollar equipment and he became proficient in the synthesis of fluorine-18-deoxyglucose and other short-lived radiopharmaceuticals. Mr. Harris returned temporarily from retirement to oversee the

installation of a new PET scanner last year. A self-professed "jack of all trades, master of none," Mr. Harris has influenced the lives and careers of world-renowned physicians and small-town nuclear technologists alike. His retirement has left a void in the field of nuclear medicine that is not likely to be filled anytime soon. His labor and efforts have made an indelible mark on nuclear medicine and its professionals. Dr. Coleman summed up Mr. Harris's contributions simply: "You don't replace a Craig Harris."

Mark A. Newman

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versity, Mubarak Hospital, and the Kuwait Cancer Control Center showed that the clearance rate of the aerosol in preliminary studies indicated that inhalation of smoke from the burning oil did not alter the integrity of pulmonary epithelial membranes.

Assessing Endocrine Function

Bone metabolism can be altered inadvertently by radionuclide treatment of thyroid disease. I.K. Lee and co-investigators at Keimyung University and Kyungpook National University in Korea studied the process and found that serum osteocalcitonin levels are initially elevated in patients with hyperthyroidism, probably due to thyroid hormone-induced increases in bone absorption, which could lead to decreased serum PTH levels.

In a related study of ten patients with thyroid carcinoma, the same investigators found that a high dose of ¹³¹I used for thyroid ablation could damage endocrine function of the parathyroid and affect osteoblastic activity in some patients. These preliminary results require confirmation from further studies.

Another group led by A. Vattimo used ^{99m}Tc-MIBI scintigraphy to assess thyroid nodules. They recommend the nuclear scan as an alternative to thyroid-stimulation hormone (TSH) stimulation for visualizing "inhibited extranodular tissue" in patients suspected to have autonomously functioning thyroid nodules.

Endemic Infectious Diseases

Brucellosis is an infectious disease endemic to regions of the Middle East. M. El-Dosouki and others at King Saud University, King Khalid University Hospital in Riyadh assessed the value of three-phase bone scintigraphy in diagnosing

skeletal brucellosis. Of 214 patients with proven disease, 53% complained of low back pain. Bone scintigraphy was abnormal in 92% of the cases. Increased bilateral sacroiliac uptake was the most common bone scan feature followed by abnormal findings in the large joints.

Confronting another infectious disease, Neshander Asli Isa from the Iran's Beheshti University School of Medicine used liver scintigraphy to evaluate patients suffering the effects of toxocariasis, an infection by nematode parasites. The researcher reported that liver scintigraphy clearly indicated single or multiple areas of decreased photons even when hepatic sonography showed normal or equivocal findings.

A. Hussein and colleagues from Mubarak Al-Kabeer Hospital, the Kuwait Ministry Public Health, and Kuwait University reported their experience using ^{99m}Tc-DTPA diuretic radionuclide imaging to study the complications of chronic urinary schistosomiasis, an infection by parasitic trematode worms also called bilharziosis. Studies of 192 patients showed that most patients with the chronic infection present with non-obstructive pelvico-calyceal retention rather than obstruction.

A round-table discussion at the congress focused on ways to advance nuclear medicine in the developing countries to address unique problems such as the onslaught of endemic diseases and the lack of diagnostic imaging equipment.

Among other achievements, the congress drew meaningful attention to the medical needs of nations such as Indonesia. In preparation for the congress, Indonesian President Suharto gave his National Atomic Energy Commission approval to purchase 15 new gamma cameras and he presided in person over the opening ceremonies of the congress. The cameras are to be installed in hospitals throughout the archipelago republic, including remote facilities that have gone without nuclear medicine imaging systems altogether.

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