

***The Fourth Asia and Oceania Congress 1988 Scientific Highlights:***

## **SOME NOVEL APPROACHES AND FINDINGS PRESENTED, BUT LIMITED RESOURCES IMPEDE GROWTH IN DEVELOPING NATIONS**

... in countries where resources are available, nuclear medicine is practiced close to the state-of-the-art and in countries which are socio-economically less developed, its clinical growth correspondingly lags.

**T**he Fourth Asia and Oceania Congress in Nuclear Medicine, sponsored by The Asia and Oceania Federation of Nuclear Medicine, was held at the Grand Hotel in Taipei, Taiwan from November 1-4, 1988, registering a record number of overseas participants. The inaugural meeting of this Congress was held in Sydney, Australia in 1976. The second Congress, which took place in Manila, Philippines four years later, was followed by the 1984 Congress in Seoul, Korea.

The Asia and Oceania Federation of Nuclear Medicine was formed during the 1974 First World Congress in Nuclear Medicine when delegates from Japan, Taiwan, Korea, Australia, New Zealand, Malaysia, Philippines, Thailand and Hong Kong voted to establish an organization reflective of those areas. Other countries including India, Pakistan, and Israel became members of the Federation later that year.

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*The Fourth Asia and Oceania Congress in Nuclear Medicine was held November 1-4, 1988, in Taipei, Taiwan. Wilfrido M. Sy, MD, Chairman of the Department of Nuclear Medicine, The Brooklyn Hospital/Caledonian Hospital, Brooklyn, NY summarized the scientific highlights from the abstracts presented.*

### **Facts, Figures and 1992**

All told there were 883 participants/attendees at the Congress representing 27 countries, with a large number of overseas delegates coming from Japan, the United States, Indonesia, and Europe. Overseas representatives totaled 611 and local attendees numbered 272.

The recent Congress proper was preceded by two-full days of teaching sessions sponsored and given by members of the Chinese American Society of Nuclear Medicine. Lectures included topics on dosimetry, instrumentation, regulatory codes, correlative imagings, NMR, as well as a well-balanced spectrum of subjects in clinical nuclear medicine. The lectures were later edited and compiled into a book format by Samuel Yeh, MD, and David Chen, MD, and made available to the attendees.

Two special lectureships were delivered by Henry N. Wagner Jr., MD and Rosalyn S. Yalow, PhD. Nine lectures made up the three plenary sessions and 24 additional lectures made up the six symposia. The invited guest speakers for these lectures were from the United States, Canada, Europe, Australia, Japan, and the Middle East. Proffered papers and



*Wilfrido M. Sy, MD*

poster presentations numbering 252 and 91, respectively, completed the agenda for the scientific program. A maximum of 40-hour CME AMA Category I accreditation was approved for the US participants through the sponsorship of the Society of Nuclear Medicine.

Twenty-one countries participated in the scientific program presentations. Of the overseas participants, Japan accounted for 138 abstracts, followed by the US with 43, Europe with 26, and Kuwait with 28. There was active participation from Canada, Australia, the Pacific rim coun-

tries, such as Singapore, Korea, Thailand, Malaysia, and Indonesia, in addition to Great Britain, Belgium, the Federal Republic of Germany, France, Greece, Italy, Poland, Denmark, and Turkey. On the last day of the Congress, members voted that the fifth Congress would be held in Kuwait in 1992.

### Roundtable: Low Level Radiation

“Effect of Low-Level Radiation and Related Issues” was the focus of dissertation and discussion during a 2 1/2 hr roundtable forum chaired by Merle K. Loken, MD. Related issues discussed included “The Greenhouse Effect and Acid Rain,” “Responsibilities of Physicians in Radiation Matters,” and “Nuclear Power: Benefit/RISK.” Those present, who included R.S. Yalow, Shigenobu Nagataki, MD, H.N. Wagner, Jr, Henry N. Wellman, MD, and M.K. Loken, interchanged experiences and focused on the need for public education to eliminate the disparity between the perceived and real risks of radiation.

### General Comments

Greater than 70% of the papers presented had clinical orientation and the balance of the abstracts dealt with subjects related to basic research. Table I is a breakdown of the different subject categories of the work presented. There was a fairly balanced distribution of the various topics covered except for cardiovascular papers, which numbered at least two times greater than the next category—bone. Seventy-five percent of the cardiovascular papers came from Japan and Taiwan. Fifty percent of the papers that involved basic computer work also came from Japan. It was evident that in countries where resources are available, nuclear medicine is practiced close to the state-of-the-art and in countries which are socio-economically less

**TABLE 1. Distribution of Abstracts (Oral and Posters) According to Subject Category**

Cardiovascular	20.4%
Skeletal	9.9
Oncology	9.3
Gastroenterology	7.9
Endocrinology	7.9
Computer	7.3
Neurology	7.0
Genitourinary	7.0
Radiopharmaceutical	5.2
Pulmonary	5.0
Immunology	4.7
Dosimetry	3.2
NMR	2.9
Radioassay	2.3
	100.0%

developed, its clinical growth correspondingly lags. Nuclear medicine is directly dependent on relatively expensive technology, the availability of appropriate radiopharmaceuticals and specially trained staff. Moreover, it must now directly compete with other imaging modalities such as NMR, CT, and ultrasonography. When it is perceived as just another anatomic or morphologic imaging modality, which is not infrequent (probably more so in countries where it has not fully developed), it competes at a great disadvantage.

In a plenary session, Richard M. Lambrecht, PhD, of the Radionuclide and Cyclotron Operations Department, King Faisal Specialist Hospital and Research Center, Kingdom of Saudi Arabia, (1) addressed the problems of radiopharmaceutical procurement in Saudi Arabia. He related their experience and how this had eased somewhat with the installation of a compact CS-30 cyclotron in Saudi Arabia in 1982. He also detailed the problems experienced during the installation process. Lambrecht indicated that the regional

cyclotron concept had been effective in the production and supply of standard-tested radiopharmaceuticals for neighboring countries in Oceania, the Middle East, and Asia. Since 1985, 17,000 unit doses of different radiopharmaceuticals namely thallium-201 chloride, gallium-67 citrate, iodine-131, iodine-123, rubidium-81/krypton-81m, and indium-111 chloride had been distributed to 14 hospitals throughout Saudi Arabia and other neighboring Arab states. Other countries that recently installed or are in the process of installing cyclotrons include Indonesia, Taiwan, Korea, China, and Australia.

### Papers Reflective of Regional Character or Interest

The paper entitled (S8-1)\* “Present State of Nuclear Medicine Practice in Japan—A Report of Nationwide Survey in 1987” by Y. Sasaki and F. Kinoshita, Japan Radioisotope Association, Tokyo, Japan, provided ex-

\*Refers to abstract nos. in *The Fourth Asia and Oceania Congress in Nuclear Medicine Proceedings*.

cellent data material on the status of Nuclear Medicine in Japan. This was based on a nationwide survey of 1250 institutions, in which a very high percent (90.5%) of the institutions surveyed responded. In the last five-year period, the overall number of *in vivo* studies (imaging) performed per day nationwide was basically unchanged—6000/day in 1982 to 6200/day in 1987. The specific type of studies however did change, with liver scintigraphs dropping from 23.8% to 9.1% and some other studies picking up. Bone scintigraphs rose from 11.2% to 19.1% while myocardial scintigraphs more than doubled in number from 3.2% to 7.2%. The most significant increase, however, occurred in the area of *in vitro* studies which jumped from  $123 \times 10^3$  to  $223 \times 10^3$  in the same five-year period. There were no SPECT studies in 1982, however, there were 450 SPECT studies in 1987.

Since available resources are so widely variable in different countries, the degree of development of nuclear medicine consequently may range from one that is mere rudimentary, to one that is state-of-the-art such as may be found in the urban hospitals in Japan, Australia, Kuwait, and in many institutions in Taipei, Taiwan, and Seoul, Korea. This is in fact inferred by K. Fukuhisa, T.A. Jinuma, T. Matsumoto, et al., of the National Institute of Radiological Sciences, Chiba, Japan, Dept. of Nuclear Medicine, Gunma University, School of Medicine, Maebashi, Japan in their paper (S8-7) "Quantitative Evaluation of Nuclear Medicine Imaging Procedures for the Diagnosis of Liver Disease in Asian Countries." This paper, as do other papers presented during the meeting, underscores the great interest in liver scintigraphy, (despite the actual drop in the number of studies in the last five years in Japan) because of the known higher incidence of primary liver

disease in this part of the globe, particularly liver carcinoma. Papers that presented similar basic data extant to the region included two works on bone mineral density (S15-4) "Bone Mineral Density of the Lumbar Spine in Japanese: Age-Related Regression in Normal Subjects and a Fracture Threshold in Osteoporotics," H. Seto, I. Nanbu, Y. Banba, et al., Dept. of Radiological Sciences, Tayamon Medical and Pharmaceutical University, Toyama, Japan and (S15-5) "Total Body and Lumbar Spine Bone Mineral Contents in Japanese Controls with Dual Photon Absorptiometry," S. Hagiwara, K. Nakatsuka, M. Nishio, T. Miki, etc.

In another paper (S7-9) P.S. Weng, C.C. Wu, and G.T. Peng, investigators from Institute of Nuclear Science, National Tsing Hua University, Hsinchu, Taiwan and Nuclear Medicine Dept. Kaohsiung Medical College, Kaohsiung, Taiwan, Republic of China, calculated the effective dose equivalent from nuclear medicine procedures in South Taiwan.

#### Areas of Regional Interest

Two areas of interest that were revisited, but this time with some regional flavor or twist were: a) "The Role of Radio-iodine-123 Uptake in the Diagnosis of Hypothyroidism Induced by Dietary Iodine Excess" by T. Michigishi, et al. from Central Clinical Laboratory, Kanazawa University Hospital and Internal Medicine, Kurobe Municipal Hospital, Japan. High iodine in the diet in this setting was due to the excessive amount of seaweed ingested by the Japanese public because of local belief that this prevents hypertension and alopecia. b) "Stress Fractures in Military Recruits" authored by W.J. Yao, H.C. Hsiao, C.S. Wu, S.Q. Liao, C.H. Hsiao, W.Y. Yan, and C.M. Chen from Naval General Hospital, Tsoying, Taiwan. The age and sex of

subjects, and distribution of the sites of stress fractures, as well as genesis of symptoms were comparable to the data from William Beaumont Army Medical Center, at El Paso, Texas (2). Despite variable habitus, military recruits apparently sustain comparable stress fractures.

C.C. Wu and co-workers from Kaohsiung Medical College, Kaohsiung, Taiwan, R.O.C., proposed the subcutaneous injection of a 1-2 mCi of technetium-99m pertechnetate at acupuncture points (k-3 and UB-60) as an alternative method in performing radionuclide venography in the paper (S18-8) "Radionuclide Venography: Subcutaneous Injection vs. Intravenous Injection." It would be of interest if data from other investigators sustain their finding.

Nine countries involved in the regional technical assistance projects sponsored by the International Atomic Energy Agency (IAEA) and Japan participated in a survey designed by the IAEA for the purpose of standardizing images obtained and equipment used to acquire these images. This work was presented under the title (S3-8) "A Cooperative Survey Concerning the Quality Control of Imaging Device with the Simulated Anatomic Liver Phantom from IAEA" and the authors were T.A. Iinuma, T. Matumoto, Y. Tateno, T. Yamasaki, K. Fukuhisa, N. Nohara, Y. Sasaki and T. Nagai, National Institute of Radiological Sciences, Chiba, Gumma University, Gumma, Japan.

Two papers (S25-7 and S25-8), one on human subjects and one on baboons, assessed the role of nuclear procedures in the evaluation of cardiac function following heart transplant. The investigators, M. Iturralde, D. Nouktsky, D.K.C. Cooper, A.G. Ross, J. Boniaszcuk of Verworld Hospital and the University of Pretoria, Groote Schuur Hospital and the University of Cape Town Medical School, Republic of South Africa

correlated the changes of acute rejection seen on endomyocardial biopsies to the cardiac radionuclide studies.

Four abstracts dealt with the subject of AIDS. Two were by R.C. Locko and T.R. Stent from Columbia University/The Harlem Hospital, New York, NY, (S19-8) "The Role of Nuclear Medicine in the Evaluation of AIDS" and (S19-9) "The Role of Nuclear Medicine in Pediatric AIDS". Two were by J. Brandhorst, S. Stazewski, G. Bittner, and G. Hor from University Hospital Frankfurt/M., F.R.G., "Albumin vs. Ga-67—Citrate Lung Scintigraphy in AIDS Patients Suffering from Pneumocystis Carini Pneumonia (PCP)" and (S19-7) "The Scintigraphic Distribution Pattern of Sessile Bone Marrow Macrophages (SBMM) in LAS and Full AIDS". At present the incidence of AIDS in Asia appears to be low and has not impacted on the logistics and cost of health care as experienced elsewhere, where its incidence is substantially higher.

### New and Modified Approaches, Ideas, and Findings

D. Yang, C. Jain, D. Patel and G. Giovaniello from The Methodist Hospital, Brooklyn, NY, introduced a new approach to bone imaging—using three-phase total body radionuclide imaging (S5-5). The total body arteriography approach through intravenous injection was well demonstrated in another paper (S18-7) entitled, "Usefulness of Intravenous Total Body Arteriography in Gated Cardiac Blood Pool Studies."

S. Inagaki, and co-investigators from Kyoto Prefectural Rakuto Hospital and Kyoto Prefectural University of Medicine, Kyoto, Japan explored the feasibility of a new system for repetitive analysis under drug intervention by radionuclide ventriculography in their paper

(S1-1) "Left Ventricular Pressure-Volume Loop Determined by Radionuclide Ventriculography and Analog Pressure Data: A New Method for Clinical Applications." Another group headed by Y. Hirasawa, Dept. of Radiology, 3rd Dept. of Internal Medicine, Jikei University School of Medicine, Tokyo, proposed a (S1-4) "New Method of Estimation of Cardiac Output With Use of Kr-81m."

A collaboration from the University of Pisa, Pisa, Italy and Institute of Biophysics, Charles University, Prague, Czechoslovakia, proposed a multitracer approach of measuring  $T_3$  and  $rT_3$  in humans in their paper (S9-1) "Assessment of the Thyroid and Peripheral Production of  $T_3$  and  $rT_3$  in Humans by a New Multitracer Method." G. Iervasi, M. Ferdeghini, S. Calvo, G. Boni, F. Caszuola, F. Carmassi and R. Bianchi, also from the University of Pisa, presented (S9-9) "A New Sensitive Method for Detection of Residual Thyroid Tumor After Surgical and I 131 Ablation of Differentiated Thyroid Cancer."

S. Tanada, et al. from Ehime University School of Medicine, Ehime, Japan evaluated (S10-3) "Performance and Clinical Application of a Newly Developed Multi-Gamma-Camera Brain Spect Scanner."

R. Smart, and co-workers from St. George Hospital, Kogarah, Australia, reported that in achalasia, large volume Radionuclide Oesophageal Transit (ROT) is a better predictor of clinical response to oesophageal dilation than small volume ROT in their paper (S13-8) "Comparison of Small (10ml) and large (140ml) Bolus Radionuclide Oesophageal Transit (ROT) Studies in patients with Achalasia."

Y. Kuniyasu, S. Higashi, S. Okada, M. Ohto, and N. Arimizu from Teikyo University Hospital, Tokyo, Japan and Chiba University, Chiba, Japan evaluated a new liver scanning agent labeled with positron emitter. (Ga-68 microspheres) (S17-10).

In the area of thrombophlebitis, F. Carmassi and colleagues from Center of Nuclear Medicine, University of  
*(continued on page 440)*

### Opening Ceremony

At the opening ceremony on Nov. 1, the President of the Republic of China, T.H. Lee personally gave his warm welcome and greetings to the attendees and participants of the Congress. President Lee emphasizes the great constructive contribution of nuclear technology towards the achievement of better health care for the individual and for humanity in general. In their respective speeches, two other speakers, Prof. Kwong-Ting Li, Senior Advisor to the President of the Republic of China, and Prof. Chun-Jen Shih, Director General of the Department of Health, Republic of China underscored the important role that Nuclear medicine currently plays in the diagnosis of different diseases that afflict man today. They also exhorted the need for continued research and development in this field.

Prof. Peter S.H. Yeh, President and Secretariat of the Fourth Congress and who is also responsible for bringing Nuclear Medicine to Taiwan, officially declared the Congress open after striking the Congress Bell four times symbolizing that this was the Fourth Congress. ■





terrain, taking background radiation into account. The data from the model compared favorably with the information from thermoluminescent dosimeters which gauge radiation emissions outside the plant. Dr. Hatch cites two advantages to the group's cross-sectional study design, the increased likelihood of observing incident cancers over cancer deaths and that "looking at rates in small geographic units is a much more sensitive approach" than looking at cancer rates for the entire population. While the study has been completed, the results will not be released until they are published, which, Dr. Hatch said, is expected to be in June.

Health officials continually monitor the TMI cohort since radiation dosage figures, even those calculated through a population-based cohort method, merely estimate the likelihood of an adverse health effect; they are not absolute and hold many unknowns. Certain effects, such as most cancers, would not appear for a decade or more after exposure. So, while the studies to date bear out the dosage figures put forth by the government and investigative agencies, more studies must be done in the future to rule out latent effects.

### Changes Since the Accident

Through the continuing studies of health consequences, the accident at the Unit 2 reactor at Three Mile Island has provided an opportunity to examine the possible effects of radiation exposure. In addition, it has prompted a re-examination of the safety of the world's nuclear power plants, which has led, particularly in the United States, to more stringent and extensive regulation and monitoring. David R. Brill, MD, assistant director of special imaging, radiology, and chief of nuclear medicine at Geisinger Medical Center, said "we dodged a

bullet with Three Mile Island... releases were very, very low and were over very quickly. The major downside was the psychological damage. The upside is that now we have some very stringent regulations and the NRC is enthusiastic about enforcing them... In the 10 years since the TMI accident a great deal has been done to make nuclear reactors safer than they were, not that they were unsafe before, but a lot was left to chance." Dr. Brill said the increased regulation in the wake of the TMI accident includes some "human proof contingencies" to ensure against human error as well as improved design specifications and training requirements. Also, Dr. Brill said the TMI Unit 2 control room design was poor and would not be acceptable under current standards.

Dr. Mallie said a major benefit of the TMI accident "was to wise up some utilities to the fact that they couldn't treat a nuclear power plant the way they treat a coal-burning plant."

Other nations have worked to improve their nuclear power operations and continue to do so. The International Symposium on Nuclear Power was held recently in Tokyo, and attendees represented The Netherlands, Switzerland, Great Britain, and other countries, in addition to the US. Discussions at the meeting centered around the need to improve the technical design of reactors, improve operator training, "streamline the licensure process... and educate the public on the relative risks of radiation compared to other forms of energy," said Dr. Tokuhata.

Changes in the standards and regulations in the wake of the accident at TMI came on both state and federal levels. Mr. Gerusky of the Pennsylvania DER told *Newsline* that in Pennsylvania the accident led to "a

major overhaul of the emergency response and emergency planning" programs. The state passed legislation requiring a nuclear safety program at each nuclear power plant directed by a nuclear engineer, as well as other safeguards now required in each plant. Additional legislation permits Pennsylvania's Governor to require, rather than merely recommend, an evacuation.

On the federal level, changes have been made affecting all aspects of reactor operations, from management through maintenance, over the 10 years since the accident, according to Harold Denton, director of the Nuclear Regulatory Commission's Office of Governmental and Public Programs. Mr. Denton, who was director of nuclear reactor regulation at the time of the TMI accident, said, the "focus [of regulatory changes] was on the recognition that severe accidents can occur if the plant isn't operated properly." The changes, he added, "were more on the human side" and included upgrading the training and emergency response programs. He said there are two direct lines between the NRC headquarters in Bethesda and each of the 108 nuclear power plants in operation in the US, to be used during emergencies and during each shift so that the NRC can keep abreast of each plant's daily operating history. In addition, the Federal Emergency Management Agency was established, which sets up drills in the localities in which there are nuclear plants. Mr. Denton concludes, "If you look at the operating history, [nuclear plants are] all operating a lot safer than they were before TMI" and "... federal, state and local governments are a lot better equipped" to handle emergency response.

Sarah Tilyou