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WORLD NEUROLOGY

THE OFFICIAL NEWSLETTER OF THE WORLD FEDERATION OF NEUROLOGY

WFN and WHO Target Neurological Care

BY DONNA C. BERGEN, M.D.
Chair, Public Relations Committee, WFN

Over the past several years, the World Federation of Neurology has strengthened and broadened its working relationship with the World Health Organization.

The WHO has long recognized the WFN as an official nongovernmental organization, and the federation has become an active working partner in some of the WHO's most recent initiatives in the field of neurology and neuroscience.

Although most neurologists are not aware of much of the WHO's work, its agendas and policies in many countries do much to influence resource allocation, manpower training, and attention to specific diseases in the specialty. For example, the WHO's program on eradicating polio globally through universal inoculation has already led to its disappearance of the disease in the Western hemisphere and its substantial reduction in other areas of the world.

In 2004, the WFN collaborated with the WHO in writing and compiling the monograph, "Atlas: Country Resources for Neurological Disorders 2004" (Geneva: World Health Organization, 2004), which for the first time assembled information about the current medical resources available for the care and prevention of neurological disease worldwide.

COURTESY DR. MARK HALLETT

Dr. Donna C. Bergen says the WHO and WFN are active partners in key initiatives.

As in a 2006 monograph on public health, which is described below, the most striking findings are of the unmet needs for appropriate medical manpower, training, and physical resources in many countries around the world.

Anti-Parkinson's drugs, for example, are not available at a primary care level in almost 40% of all countries. Fewer than 500 trained neurologists were identified in all of Africa. Over two-thirds of low-income countries reported complete unavailability of disability benefits for those with neurological disorders. The project documented the complete absence of neurological specialists in many developing countries, noting that it was essential for neurological care for common illnesses to be integrated into primary health care to extend health services to underserved areas in these countries.

Two years later, another major WHO monograph, "Neurological Disorders: Public Health Challenges" (Geneva: World Health Organization, 2006) was published, again with WFN collaboration.

The project described in this book was prompted by estimates at the time of the large burden of global disease made up by disorders of the nervous system, particularly in low-income countries. The document notes, for example, that malnutrition can have serious short- and long-term neurological consequences, such as mental deficit, neural tube deficits, and polyneuropathy, yet most of these disorders are preventable.

This burden of global disease is expected to increase over the next several decades. In

See **WHO** • *page 8*

INSIDE

New Techniques Find TBI Missed by Standard Scans

BY JEFF EVANS
Elsevier Global Medical News

Advanced imaging methods with MRI and magnetoencephalography may be able to detect mild traumatic brain injury with greater accuracy than can conventional imaging techniques, according to two prospective pilot studies.

Conventional MR and CT neuroimaging focus on the detection of bleeding, which is only indirectly related to axonal injury. These methods are not able to detect about 70%-80% of mild to moderate traumatic brain injuries (TBIs), according to Mingxiong Huang, Ph.D., of the University of California, San Diego, and his colleagues.

Dr. Huang and his coinvestigators are finding that the combination of diffusion-tensor imaging (DTI) and magnetoencephalography (MEG) can reveal axonal injury resulting from tissue shearing and stretching, which is a leading cause of persistent postconcussive symptoms in mild TBI patients.

Researchers at the University of Miami (U.S.A.) also have been looking for ways to determine the prognosis of patients with TBI through the use of magnetic resonance spectroscopic imaging (MRSI), which has revealed changes in brain metabolism that are indicative of mild TBI in patients with postconcussive symptoms.

Detecting mild TBI is clinically important, Dr. Huang said, because even though roughly 85% of patients with mild TBI will be symptom free by 6 months, the remaining 15% have lingering cognitive and behavioral problems, and have a higher risk for developing epilepsy, severe depression, and dementia.

Dr. Huang and his colleagues studied 18 civilian and military patients with a closed head in-

See **TBI** • *page 8*

EDITOR IN CHIEF'S COLUMN

Of Frontiers—and Fun

BY MARK HALLETT, M.D.

In this issue, Professor Jim Lance shares some neurological stories, all of which revolve around his experiences throughout his illustrious career (p. 15).

He has worked in many areas of neurology, traveled widely, befriended many other neurologists, and has been a major force in building Australian neurology. What comes across clearly in his narrative is that all the while he has been having fun.

Neurology is fun. It deals with the brain, which is still a mysterious organ. We don't yet know all the things it does, and we don't know all its operating principles. It is an exciting frontier for medical knowledge. There are hundreds, if not thousands, of neurological disorders, and new ones continue to be identified. Neurologists have the continuing opportunity to achieve eponymous recognition. We have to approach each patient as a detective might, sifting through the various signs and symptoms to reach a diagnosis. And our medical colleagues can no longer tease us about the lack of therapies for our patients. We can work miracles. All of us remember our dramatic cures. One of my favorites is the patient with dopa-responsive dystonia who rapidly rose from the wheelchair she had been confined to for more than 5 years.

Our neurologist colleagues, who share our enjoyment of the intellectual challenges, can be good friends. We like telling stories to each other, about patients and other experiences. And we like telling jokes. One of my teachers was Dr. C. Miller Fisher, a brilliant man, who thinks deeply about neurological disorders, and has had such enormous experience that he could make a diagnosis almost instantly. During 1 month, when he was the attending neurologist on the teaching ward, we would pass a neurosurgical patient daily, who was constantly shouting, "Doctor, doctor, help me, help me." As this wasn't our patient; we did not know any clinical details. One day as we passed the patient, Dr. Fisher turned to me and asked, "Mark, do you know what this patient has?" I replied that I did not. He then said, "I don't know either, but it's the worst case of it that I have ever seen."

OUR MEDICAL COLLEAGUES CAN NO LONGER TEASE US ABOUT THE LACK OF THERAPIES FOR OUR PATIENTS. WE CAN WORK MIRACLES.

Some neurologists are practical jokers. There is the story about Jerome Letvin, the famous neuroscientist at the Massachusetts Institute of Technology in Cambridge, U.S.A., who made one of the first observations about how the visual system begins to process visual information even in the retina. His paper, "What the Frog's Eye Tells the Frog's Brain," is a classic. His early training was as a neurologist at the Boston City Hospital when D. Denny-Brown was professor.

One morning before rounds, he went around to all the patients and told them to extend their great toe when the "old man" scratched the bottom of their foot. Dr. Denny-Brown was getting more and more perplexed as the rounds went on, and finally, he stopped and asked rhetorically, "Now why would the toe go up?" The patient pointed to Letvin and explained that he told him to do so. Denny-Brown did not have much of a sense of humor, and fired Letvin on the spot. Neurology's loss and neuroscience's gain. ■

TALK BACK

We're Waiting to Hear From You …

Do you have an idea for a story? Do you want to comment on something you've read recently in WORLD NEUROLOGY? Or perhaps you'd like us to share news of your research or upcoming event with the global neurology community. Send us an e-mail at worldneurology@elsevier.com.

A Meeting of The Minds

Member societies of the World Federation of Neurology are invited to enter a team of four neurologists in the Tournament of the Minds at the 2009 World Congress of Neurology on Oct. 24-30 in Bangkok, Thailand. The teams will compete against one another in a knockout competition in which they will have to answer questions covering a range of neurological topics.

The purpose of the Tournament is both educational and entertaining. Clinical cases from around the world will form the basis of the questions, which will be presented mostly as visual material—videos and stills—and with a minimum of text. A prize will be awarded to the winning team.

All of the teams will participate in a qualifying round on Oct. 28. Of those, the eight top-scoring teams will advance to a semifinal round on Oct. 29, where they will compete in two groups of four teams each. The winners from each of those groups will face each other in the final on Oct. 30, just before the Closing Ceremony.

There will be one team per country, but for countries where there is a limited number of neurologists, a team may consist of nationals from more than one country.

We hope that as many countries as possible will compete. If you wish to participate, please contact the president of your local Member Society who will be responsible for coordinating your national team.

The deadline for the application is noon on Oct. 27.

For further details and the application form, please send an e-mail to wcn2009.tournament@gmail.com or wcn2009@congrex.com; or visit the WCN 2009 Web site at www.wcn2009bangkok.com. ■

WORLD NEUROLOGY

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PRESIDENT'S COLUMN

The Training of a Neurologist

BY JOHAN A. AARLI, M.D.

The British neurologist, Macdonald Critchley, wrote in an essay titled, "The Training of a Neurologist," that the life of a neurologist falls into three phases: In the first part, the duties of the profession are learned; in the second, they are practiced; and in the third, they are taught to others.

Although he was referring in particular to the practice of neurology in Britain, there is general agreement about the training schedule he described in his work, The Divine Banquet of the Brain and Other Essays (New York: Raven Press, 1979).

However, opinions still vary on the role of psychiatric training for a neurologist and on the exact number of months for each element of the curriculum. Dr. Critchley advised a 4-year residency of clinical neurology, during which the candidate would become familiar with all manner of major and minor clinical problems, with chronic and acute neurology, including emergencies of neurological practice.

He regarded neurology as an aspect of internal medicine and recommended an initial 18-month senior internship in general medicine as the first step, followed by another 18-month apprenticeship in the basic sciences, and he pointed out the importance of genetics and medical statistics. The dramatic development in molecular genetics in 30 years since the essay was published illustrates his insight and understanding of the evolution in clinical neurology.

He also made it clear that the young neurologist would have three functions: the diagnosis and care of the neurological sick within the community; the teaching of students, both undergraduate and postgraduate; and research.

But communities are changing, and teaching in neurology has to be based on the disorders that are predominant in the community where the neurologist will be responsible for diagnosis and care. The pattern of neurological diseases with which the young neurologist is confronted is different in Abidjan in the Ivory Coast and Athens in Greece, and in Ulaanbaatar, Mongolia, and Yaounde in Cameroon. Some infectious diseases are common in Africa and almost unknown in the West. Tuberculous meningitis remains very common in India. The challenges relating to the global AIDS epidemic vary enormously among countries. The prevalence and causes of dementing disorders, of hereditary ataxias, and of epileptic disorders are different. This is reflected in the spectrum of disorders that forms the basis of teaching in neurology.

There is a dearth of neurologists in many developing countries, especially in sub-Saharan Africa. Where should they have their training? New specialists prefer to stay in the countries where they have qualified. Complementing locally acquired experiences with a focus on sophisticated techniques is preferable to full 4-year residencies out of the continent. Wherever possible, neurologists should be trained in their own countries. Meanwhile, we should focus on training centers on the African continent, with a higher probability that the candidates, when graduated, will return to their countries of origin.

However, neurologists do not exist in a vacuum. There must be health workers to guide potential patients to specialized service. Most patients with neurological disorders receive treatment and care in primary care settings. A public health system is needed also for the identification and follow-up of patients with neurological disorders. Neurological services should be provided at all levels of health care.

Ethiopia is a good example. It now has 14 neurologists for a population of about 80 million people. But most patients still have no access to a neurologist. If they make it to a clinic, they may see general practitioners, nurses, or health care workers who may have little or no training in diagnosis and care of common neurological disorders. A lack of reliable diagnostic and therapeutic tools aggravates the problem.

Steps need to be taken at the primary care level to narrow the treatment gap. To improve neurological care, neurologists have a role in integrating neurological care at the village level, thereby facilitating earlier recognition and management or better referral mechanisms.

In Senegal, Dr. Gallo Diop has demonstrated the success of "neurocaravans" in bringing neurological care to the countryside. Telemedicine is another example of how excellent neurological service can reach far-away destinations, as Dr. Pierre Bill of South Africa writes on page 10. Pilot studies are needed to see how videoconferencing can be applied in education and training as well as in medical practice.

There is a long way to go and progress is slow, but many African colleagues feel optimistic about the future of training of neurologists in Africa. ■

WORLD NEUROLOGY'S Year of Change

WORLD NEUROLOGY underwent dramatic changes in 2008. In March, Professor Jagjit S. Chopra produced the final issue of his long and successful tenure as Editor in Chief. I succeeded Professor Chopra and presided as Editor in Chief over the next three issues of the newsletter.

With the change of editor, came changes in the format and style of the newsletter: The page size increased slightly (to 11 x 14 inches), it started including general and clinical news about the specialty in addition to the usual updates and reports from the WFN, it began carrying advertising, and there were changes in the distribution procedures.

By including advertising, it is hoped that the publication will generate revenue for the Federation. It is the only publication that goes to all neurologists worldwide, which should make it an appealing prospect for advertisers. Some advertising markets vary by geographical region, depending on what products are available. So different editions of the newsletter carry different advertisements, although the clinical and WFN content remain the same across all editions. The editorial board has been increased with members from around the world. And, as before, issues of WORLD NEUROLOGY continue to be placed on the WFN Web site as well as being delivered as paper copies.

The new venture is a partnership with Elsevier, which also publishes the WFN's official journal, the Journal of the Neurological Sciences. The International Medical News Group, a division of Elsevier, has direct responsibility for assisting me in the production of the newsletter. There have been some problems with distribution, but it is hoped that these are now solved.

Starting in 2009, the number of issues has increased from 4 to 6 per year, which should make the general news and Federation material more timely. There will be four separate editions of each issue, again, differing only in advertising copy and geared to one of the following regions: the U.K.; Europe (excluding the U.K.); the U.S.A. (including Canada and Central and South America); and Asia, Australia, the Middle East, and Africa combined. The size has been changed again, this time reduced to 10.5 x 14 inch "green size."

The proof of the pudding is in the eating, and the WORLD NEUROLOGY staff hopes that everyone is enjoying reading the publication. We welcome news and solicited contributions, including letters in response to publications, and, of course, feedback, all of which can be sent to worldneurology@elsevier.com.

Mark Hallett, M.D.
Editor in Chief

Steady and Focused, Despite the Global Economic Crisis

BY RAAD SHAKIR, M.D.
Secretary-Treasurer General, WFN

In 2008, we witnessed worldwide financial turmoil to an extent not seen in the last 2 decades. As I reported last year, the World Federation of Neurology had taken steps to invest in a number of high-interest accounts through the United Kingdom's Charities Aid Foundation, and the monthly income from those accounts has contributed a great deal to our running costs while also helping fund our charitable objects.

I also noted last year that it was important for the WFN to diversify its revenue sources to be less reliant on any surpluses generated by each World Congress of Neurology.

The financial crisis, combined with some concerns about international political developments, has already shown the need for this strategy. Stability seems to be returning to Thailand, the venue of our World Congress this year, and we look forward to an exciting and successful scientific, educational, and social program in the "Land of Smiles." Thereafter, we'll embark on our new biennial rota of meetings, starting in 2011 in Marrakesh, Morocco, and followed by a European destination in 2013.

The Federation also continues to grow and extend its global coverage and to pursue its mission on the African continent. Three of the four neurological societies approved by the Council for WFN membership in 2008—Burkina Faso, Cameroon, and Guinea—are African states. We welcome them, and Armenia, the fourth new member.

We are now an association of some 107 neurological societies in 106 countries and regions. More than 40 of these countries with economies classified by the World Bank as low or lower-middle income benefit from participation in our continuing medical education program. Thanks to the altruistic and generous support of the American Academy of Neurology, through donation of copies of its publication Continuum, the WFN can fulfill this essential part of its mission. This is a fine example of how a developed nation recognizes its advantages and selflessly supports fellow professionals in less fortunate circumstances elsewhere.

With so many societies now part of the WFN family, communication is key to maintaining awareness of the Federation's initiatives among the almost 30,000 neurologists linked through our organization. The medium through which this goal is primarily achieved is our newsletter, WORLD NEUROLOGY. As noted elsewhere, we have entered into a more favorable arrangement with our publisher. We fully expect these changes will pay dividends and that the publication will soon begin to fulfill its potential by attracting greater advertising and other revenue.

It is a sign of the healthy state of WFN finances that even in these difficult times, we can continue supporting well-established projects and take on new ones. Prudent financial management remains essential, however, and will be the watchword of the remaining term of office of the present administration. ■

NEUROLOGY IN PRACTICE

In Britain, It's the Good, the Bad, and the ABN

Neurology in Britain has both major strengths and weaknesses, and organizations such as the Association of British Neurologists (ABN) are important in future developments.

What is special about neurology in Britain? I came to the United Kingdom as a visiting Australasian registrar in 1993 for the last years of my training and could judge the situation with some objectivity. The best elements of British neurology I found, and continue to see, are impressive clinical skills, based on a fine tradition of teaching; a clear and logical approach to diagnosis; and outstanding clinicians and scientists. Armed with vast practical experience, finely tuned instincts, and a tendon hammer, British neurologists are masters of clinical assessment. The pressures of small numbers, and until recently, limited access to investigations, have forged these skills.

The worst of working as a neurologist in Britain is the quicksand of bureaucracy, guidelines, revisions, and the amount of administration we must wade through. Judging from conversations with friends and colleagues working elsewhere, this seems to be a widespread phenomenon, with local variations. Government targets and strategies for health care are constantly shifting, accompanied by complex and hefty documentation, requiring consultation and comment, often within days of release. It is tempting to ignore these tomes, and focus on our clinical and academic work alone. This "real work" was, after all, what drew us to neurology. However, we cannot ignore the political aspect of our work, if we want to influence future services for our patients.

The ABN represents neurologists in trying to positively shape the future of neurology. Doctors are not trained as politicians, and many of us do not take on politics with enthusiasm. But we need to take an active role in promoting high standards.

We particularly need to secure future acute neurologic services. The previously small number of British neurologists, with highly honed skills, has resulted in a lack of involvement in acute neurological emergencies, in particular, stroke. Evidence strongly supports the importance of neurologists' involvement in these areas. Research shows that this is where we make the biggest difference to the lives of our patients, in terms of guiding both diagnosis and management.

An expanded acute role in neurology in these areas, on a foundation of excellent training, is vital if neurology in the United Kingdom is to play a vibrant role. Otherwise, the specialty will be marginalized. We have much to learn from our colleagues in other countries in planning and developing this expansion.

BY HEATHER ANGUS-LEPPAN, M.D.

Dr. Angus-Leppan is a consultant neurologist in London and serves as meetings secretary and honorary assistant secretary of the ABN.

In addition to playing an active planning role, the ABN is involved in improving training and teaching. Central to this is a vitalization of meetings. During June 22-26, 2009, the association will have an inaugural annual meeting in Liverpool, where we will present some of the best of clinical and academic neurology and endeavor to strengthen and foster links with colleagues from overseas.

The first meeting will be held in conjunction with the Spanish Society of Neurologists, and future joint meetings in the Netherlands, Cuba, and Sri Lanka will continue the tradition of sharing with overseas colleagues.

Teaching and training are crucial at all stages of our careers, and the ABN plays a major role in this as well, particularly in knowledge-based assessments. Inspired future neurologists are essential, and the ABN trainees are well-organized and sophisticated in gathering data on and positively influencing patterns of training.

COURTESY DR. HEATHER ANGUS-LEPPAN

The coat of arms of the ABN: The association has a key role in the future of neurology in Britain.

The association is also working to improve communication, with the introduction of a new Web site and better use of the electronic newsletter to update members on developments.

The Association of British Neurologists has a role in the future of British neurology. The challenges for us are to carry forward our predecessors' clinical skills and academic tradition, to learn from colleagues in the United Kingdom and abroad, and to combine enthusiasm with political astuteness in improving neurological care of our patients, particularly their acute care. ■

Neuroethics Research Group: Guiding EOL Challenges

BY FRANZ GERSTENBRAND, M.D.
Chair, Neuroethics Research Group, WFN
AND HOLGER BAUMGARTNER, M.D.
Secretary, Neuroethics Research Group, WFN

The World Federation of Neurology's Neuroethics Research Group was founded as an ad hoc committee for neuroethics in 2001, and its status was changed to that of Research Group the following year.

Neuroethics covers a range of ethical and social issues that can arise in the neurosciences, from clinical research to daily neurological practice. Its tenets are rooted in the Hippocratic principles, but over the years, other concepts from documents such as the United Nations' 1948 Universal Declaration of Human Rights, the World Medical Association's 1964 Declaration of Helsinki, and the 2005 Universal Declaration on Bioethics and Human Rights have been incorporated. From this point of view, neuroethics is not a research field—no details have to be discovered; nothing can be removed.

Although the principles of modern-day neuroethics are well-established and widely documented, ethical thinking and practice still present a challenge for neurologists. One example of such a challenge would be the increasing involvement of neurologists in end-of-life (EOL) decisions, especially when they have to act on a legal judgment.

One of the main activities of the Neuroethics Research Group has been to organize teaching and training courses in ethics for neurologists. In this regard, the WFN Research Group is participating in a special interest group for neuroethics in collaboration with the World Federation for NeuroRehabilitation (WFNR). It is also working closely with the International Society for Amelioration of Quality of Life in Chronic Neurological Conditions, chaired by Dr. Stavros I. Baloyannis of the Aristotelian University in Thessalonika, Greece, to develop a program for the treatment and care of chronic neurological patients, such as apallic patients or those who are in a vegetative state. The need for such a program was highlighted by the cases of two women—an American and an Italian—in which courts granted permission for hydration and nutrition to be withdrawn, but the ethics of such actions was hotly debated.

THE RESEARCH GROUP IS ALSO ABOUT TO BEGIN COMPILING A TRANSCULTURAL ADAPTATION OF ITS CURRENT ETHICAL DIRECTIVES.

In September 2008, a workshop on neuroethics was held during the World Congress of NeuroRehabilitation in Brasilia, Brazil, and another will be held this year at the World Congress of Neurology in Bangkok.

In addition, the Research Group and the special interests group for neuroethics at the WFNR are preparing a teaching course that will be presented at the WFNR's world congress in Vienna in March next year.

The Research Group receives no outside financial support, because we believe it would be unethical to ask the pharmaceutical or the electronic industries to support a teaching course or a workshop for neuroethics. The WFN's Management Committee has allotted funds to cover the costs of the Research Group's teaching courses and its other activities.

The Research Group is about to begin work on an important project—compilation of a transcultural adaptation of the current ethical directives in neurology.

The existing directives are based on historical and religious rules of European civilization, the philosophy of Aristotle, and the influences of the Christian philosophical teachings of Augustine and Thomas Aquinas. These "Western ethical rules" should not be imposed on different cultural and religious communities–rather, the principles should be adapted so that they apply worldwide. As such, the Research Group is working closely with various ideological and religious institutions for their input and guidance on how best to approach this task. This raises the question, however, as to whether the Research Group on Neuroethics should be organized as a Special Committee for Ethical Principles in Neurology. ■

Calendar of International Events

2009

19th Meeting of the European Neurological Society
June 20-24
Milan, Italy
http://www.ensinfo.org

Association of British Neurologists Annual Meeting
June 22-26
Liverpool, U.K.
http://abn.org.uk/meetings/annual-meeting.php

The International Conference on Alzheimer's Disease
July 11-16
Vienna, Austria
http://www.alz.org/icad

6th Congress of the European Federation of IASP Chapters
September 9-12
Lisbon, Portugal
http://www2.kenes.com/efic/Pages/Home.aspx

13th Congress of the European Federation of Neurological Societies
September 12-15
Florence, Italy
http://www.kenes.com/efns2009

2009 World Congress on Huntington's Disease
September 12-15
Vancouver, Canada
http://www.worldcongress-hd.net

134th Annual Meeting of the American Neurological Association
October 11-14
Baltimore, Md., U.S.A.
http://www.aneuroa.org/2009_Baltimore

19th World Congress of Neurology
October 24-30
Bangkok, Thailand
http://www.wcn2009bangkok.com

The Sixth International Congress on Vascular Dementia
November 19-22
Barcelona, Spain
http://www.kenes.com/vascular

XVIII WFN World Congress on Parkinson's Disease and Related Disorders
December 13-16
Miami Beach, Fla., U.S.A.
http://www.kenes.com/parkinson

2010

3rd International Congress on Gait & Mental Function
February 26-28
Washington, D.C., U.S.A.
http://www2.kenes.com/gait/pages/home.aspx

Honoring Johannes Noth

BY GEREON R. FINK, M.D.

Participants gathered at a Festschrift meeting in Vaals, the Netherlands, in March to pay tribute to the German neurologist and neurophysiologist, Johannes Noth, Ph.D., in recognition of his significant contributions to the understanding of motor physiology and in particular, of spinal and supraspinal reflexes and spasticity.


JOHANNES NOTH, PH.D.

As president of the German Neurological Society and secretary of the International Federation of Clinical Neurophysiology, Dr. Noth has also had a notable impact on the development of neurology and neurophysiology as important clinical disciplines.

Dr. Noth has devoted much of his scientific career to spinal cord physiology and the cognitive aspects of motor control. He was originally trained as a neurophysiologist by Alois Kornmüller and Joachim Haase at the Max Planck Institute in Göttingen, and later went into clinical neurology. He received extensive clinical training under Richard Jung at the University of Freiburg and Hans-Joachim Freund of the University Hospital Düsseldorf before being appointed director of the department of neurology at the prestigious Alfried Krupp Krankenhaus in Essen. He subsequently succeeded Klaus Poeck as chair of neurology at the Rheinisch-Westfälische Technische Hochschule (RWTH) in Aachen.

The conference, which was titled "The Sensorimotor System: From Reflexes to Cognition," provided an update of recent anatomical, electrophysiological, functional imaging, and neuropsychological studies of the structural basis and neural mechanisms underlying sensorimotor control. It was organized as a forum that, in addition to honoring Dr. Noth, would also foster discussion about novel findings and concepts. There was much emphasis on the interaction between perception and action as well as the particular contribution of neurophysiology to our understanding of motor learning and recovery of function. Exciting novel insights into the neural mechanisms underlying motor learning or the neural basis of intracortical inhibition and its implication for movement disorders or recovery of function were reported.

An important topic of the meeting was lesion-induced reorganization (plasticity). Here the participants' contributions ranged from postmortem studies of human spinal cord tissue (Dr. Garry Brook, RWTH) to upper motor neuron disease (Dr. Reinhard Dengler, Hannover Medical School), and from gait coordination after spinal cord injury to subcortical stroke.

I presented a study that showed the combined effective connectivity analyses (using fMRI) of the neural networks underlying paretic hand movements after a stroke and the use of repetitive transcranial magnetic stimulation (rTMS) protocols to normalize contralesional primary motor cortex hyperactivity, which impairs ipsilesional recovery of motor network function and paretic hand recovery. Consistent with the data obtained in subcortical stroke patients, Peter H. Ellaway, Ph.D., of Imperial College, London, demonstrated the use of rTMS to promote recovery of function in spinal cord injury.

Dr. Manuel Hulliger of the University of Calgary in Canada contributed to this debate by reporting data obtained in animal models of neurolocomotor rehabilitation, suggesting that challenge-enriched skill training rather than massed practice seems to be particularly effective for neurorehabilitation. Dr. Reiner Benecke of the University of Rostock, Germany, emphasized the importance of impaired inhibitory mechanisms underlying cortical dysfunction by demonstrating impaired intracortical inhibition due to deafferentation of primary motor cortex and resulting hyperactivity of inhibitory interneurons to underlie motor abnormalities, including features of motor neglect. Dr. Mark Hallett of the National Institute of Neurological Disorders and Stroke in Bethesda, Md., U.S.A., presented recent findings suggesting that patients with Parkinson's disease do not show the typical decline in motor network activity that is associated with movements becoming automatic.

Considering the broad spectrum of research in this field and its rapid progress, the presentations reflected the importance of bringing together basic and clinical neuroscientists to advance understanding of the sensorimotor system and higher motor cognition to provide novel approaches to neurorehabilitation. The meeting highlighted the need for an integrated structural and functional approach to the area of motor control and motor learning both in normal persons and in patients suffering from motor disorders that result from stroke or neurodegeneration. ■

DR. FINK *is the professor of neurology at the University of Cologne, director of Cologne University Hospital's neurology department, and director of the Institute of Neuroscience and Medicine at the Research Centre Jülich.*

Traveling Fellow: Epilepsy, Critical Care Meetings

BY EDGAR AVALOS HERRERA, M.D.

Dr. Herrera is chief resident in the department of neuroscience at the Hospital General San Juan de Dios in Guatemala City.

It was with great excitement that I learned that I had received a 2008 Junior Travelling Fellowship from the World Federation of Neurology. I chose to use the fellowship to attend two meetings whose themes—epilepsy and neurocritical care—focused on my area of clinical training and dealt with the daily challenges I face in my work.

The first meeting I attended was the 6th Annual Neurocritical Care Society Meeting in Miami Beach, Fla., U.S.A., where I had the opportunity to meet with leaders in the field of neurointensivism. Among the many topics included in the presentations and discussions at this meeting were traumatic brain injury, stroke, hypothermia, multimodality monitoring, and neuroimaging.

Several investigators presented their research findings during the poster sessions. The work was of a high standard and very relevant to clinical practice. I, too, had the honor of presenting two posters from my country, Guatemala: one titled "Evaluation of Short-Term Mortality With Four Score and Glasgow Coma Scale in Patients With Traumatic Brain Injury," and another titled "Mushroom Poisoning in the Neurointensive Care Unit."

Overall, I came away feeling I had gained substantially by attending the meeting. As a member of the Neurocritical Care Society, I encourage other neurologists from around the world to join the society and attend these valuable annual gatherings.

The second meeting was miles away from Miami, this time in Montevideo, Uruguay, where I attended the 5th Latin American Congress of Epilepsy. There, the presentation topics included refractory epilepsy, epilepsy surgery, EEG and video-EEG courses, seizure prediction, and new treatments, to mention a few.

During the poster sessions at the epilepsy meeting, I presented preliminary findings of a study that I coauthored with Dr. José E. Cavazos of South Texas Comprehensive Epilepsy Center in San Antonio (U.S.A.), titled, "Online Epilepsy Education in ILAE [International League Against Epilepsy] Chapters and Other Professional Organizations: Resources and Needs." It was particularly encouraging and informative to receive positive and constructive comments from experts in the field.

I will be always grateful to the WFN for giving me this tremendous opportunity, one that opened doors for me and changed my life. ■

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Mild Injury Detected

TBI • *from page 1*

jury and mild to moderate symptoms of TBI, along with 17 healthy control patients. None of the patients had visible lesions on conventional MRI or CT.

MEG pinpoints the temporal and spatial activation of neurons in the brain based on the tiny magnetic fields created by neuronal currents in cortical gray matter diffusion-tensor imaging measures the pattern and direction of the movement of water molecules through white matter fiber tracts, which become disturbed after a TBI.

In patients with TBI symptoms, the researchers found that the location of neurons generating abnormal low-frequency delta waves that were seen on MEG was significantly correlated with the deafferentation of the underlying white matter fiber tracts on DTI.

These findings were consistent with the patients' symptoms and the results of neuropsychological exams, and they help to confirm the hypothesis that pathological low-frequency delta waves are caused by the shearing of white matter fiber tracts, Dr. Huang reported at the annual meeting of the Society for Neuroscience.

Magnetoencephalography may be a more sensitive measure for mild TBI than is diffusion-tensor imaging because, in some instances, magnetoencephalography was able to detect pathological low-frequency delta waves when DTI signals in white matter fiber tracts were within normal range, according to Dr. Huang.

He also noted that the two modalities could be used to objectively monitor the effect of an intervention and provide prognostic information.

The investigators hope to expand their research by performing a longitudinal study in children that compares their recovery from mild TBI with the recovery of adults.

In military personnel, the researchers would like to know how to differentiate the signs and symptoms of mild TBI from those of posttraumatic stress disorder. Both conditions have similar signs and symptoms and coincide in a subpopulation of patients, but the treatments for them are different.

In another study presented at the meeting, Andrew Maudsley, Ph.D., of the University of Miami and his colleagues used magnetic resonance spectroscopic imaging to measure levels of *N*-acetylaspartate, creatine, and choline in the brain.

The researchers used a volumetric acquisition method to obtain data on the whole brain rather than on just a single area, which is beneficial in imaging diffuse brain injury, according to Dr. Maudsley.

"If you used a conventional MRS method, which is a single voxel method, you have to [focus on] one brain region. You could very clearly choose a brain region, especially with mild injury, that actually looks normal on spectroscopy," he said in an interview.

The pilot study compared the average of all measured values from 22 patients who were classified as having mild brain injury with the average values from 67 age-matched controls. MRSI scans took place a median of 21 days after the patients' injuries, which were caused by motor vehicle accidents (17), falls (2), or assault (3).

Assessments of the group averages revealed that brain injury was associated with a significantly decreased level of *N*-acetylaspartate (a marker of neuronal and axonal viability), as well as an increased level of choline (a marker of membrane metabolism). The ratio of choline to *N*-acetylaspartate was the most sensitive marker for injury.

Overall, 90% of the patients had small and well-localized lesions on normal MRI, findings that are typical for mild TBI. But on magnetic resonance spectroscopic imaging, the researchers found widespread metabolite alterations throughout the cerebrum.

ABOUT 85% OF PATIENTS WITH MILD TBI ARE SYMPTOM FREE AT 6 MONTHS; THE REST FACE LINGERING PROBLEMS AND RISK DEPRESSION AND DEMENTIA.

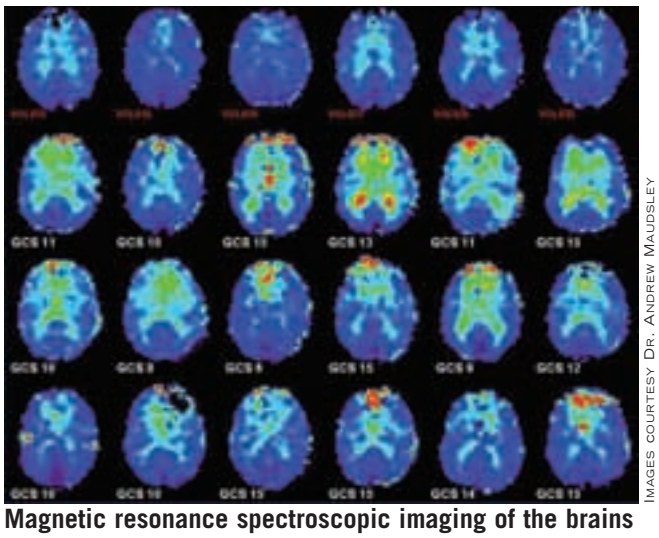
The patients' scores on neuropsychological tests were significantly correlated mostly with metabolite changes in the right frontal region. In one patient who underwent follow-up scans, the concentrations of *N*-acetylaspartate and choline continued to change significantly at 7 and 15 months post injury.

Dr. Maudsley said that he and his team hope to obtain longitudinal assessments of metabolite levels to determine if their short-term levels can predict future outcomes of patients with mild traumatic brain injury. Outcomes at 6 months in close to half of the patients have shown some correlations between metabolite levels and scores on neuropsychological tests, he noted.

"It's my feeling that these metabolites really take several days, if not a couple of weeks, to change. In the one example in which we had a more severe injury, things were actually worse at 6 months than they were at 5 weeks," he added.

The use of the 3-tesla magnetic resonance scanners that Dr. Maudsley and his associates used in their study is beginning to extend beyond academic medical centers and into regular clinics, especially for brain MRI applications.

The volumetric acquisition method that Dr. Maudsley and his associates used in their analyses "would be very simple to implement on commercial instruments. "One of the aims of my work is to get away from the need for analyzing spectra. Most clinicians don't have the training or don't want to look at spectra. They want to look at images."



Images courtesy Dr. Andrew Maudsley

Magnetic resonance spectroscopic imaging of the brains of 18 traumatic brain injury patients (bottom three rows) show widespread alterations in the ratio of choline to *N*-acetylaspartate (light blue to green color), unlike the brains of 6 control subjects (top row).

Dr. Michael F. Finkel, a neurologist practicing in a private multispecialty clinic in Naples, Fla., U.S.A., said that "individuals who suffer from traumatic brain injury, and their families, frequently have difficulty understanding their illness and receiving appropriate treatment and compensation. They have symptoms that cannot be identified by clinical examination or substantiated by current imaging techniques that are available outside of research centers

"These individuals frequently lose work and revenue, and some lose the ability to continue in their professions because of residual symptoms. These individuals will have claims on their national disability services as well as any personal disability insurance that need to be verified. If they were injured by negligence, accident, or national service– or work-related problems, they will need data to support their case before panels that review claims related to worker's compensation and personal injury."

Dr. Finkel, who is not involved in either research effort, added that "unfortunately, many of these individuals do not manifest obvious clinical signs of brain injury, and may be labeled as malingerers and/or compensation seekers."

He said that the two studies "provide a resource that can provide the objective data required by disability boards and courts of law. They provide medical support that their symptoms are real, and allow their injuries to be promptly addressed and compensated without the indignities that many of them endure before receiving compensation that is often inadequate and inappropriate for their actual losses."

Neither Dr. Huang nor Dr. Maudsley had conflicts of interest to report. ■

Active Partners in Global Quest

WHO • *from page 1*

2005, neurological disorders were estimated to constitute over 6% of the global burden of disease; if neurological complications of other medical disorders such as diabetes and HIV/AIDS are included, then that figure almost doubles.

The text of the 2006 publication discusses the care and prevention of the most prevalent neurological disorders using basic techniques of public health.

The introduction states that "Public health professionals approach neurology more broadly than do neurologists by monitoring neurological disorders and related health concerns of entire communities and promoting health practices and behaviors among them to ensure that populations stay healthy."

For 10 of the most prevalent neurological disorders, the book summarizes their epidemiology, the private and public burden of the disorder, treatments, research strategies, as well as the kinds of medical personnel that are needed and what their training should entail.

It concludes with recommendations for action by the medical community, specifically in preventive measures, adequate resource allocation, and training of appropriate health care providers.

Both the WFN and WHO hope that these unique documents will be used by ministers of health, health care planners, and patient advocates to help improve the care and prevention of neurological disorders.

ONE PROJECT NOTED IT WAS ESSENTIAL FOR NEUROLOGICAL CARE FOR COMMON ILLNESSES TO BE PART OF PRIMARY CARE IN DEVELOPING COUNTRIES.

The two documents were distributed to the ministers of health of all WHO member countries and are available online for free. The address for the Atlas is www.who.int/mental_ health/neurology/neurogy_atlas_lr.pdf, and the address for the monograph on the public health challenges of neurological disorders is www.who.int/mental_ health/ neurology/neurodiso/en/index.html).

Today, with its Africa initiative, the WFN is again partnering with the WHO and with its African members to focus on improving care for those with neurological disorders. The project brings together major neurological and neuroscience groups from African countries and elsewhere, to expand and enhance training, continuing medical education, and research in sub-Saharan Africa. ■

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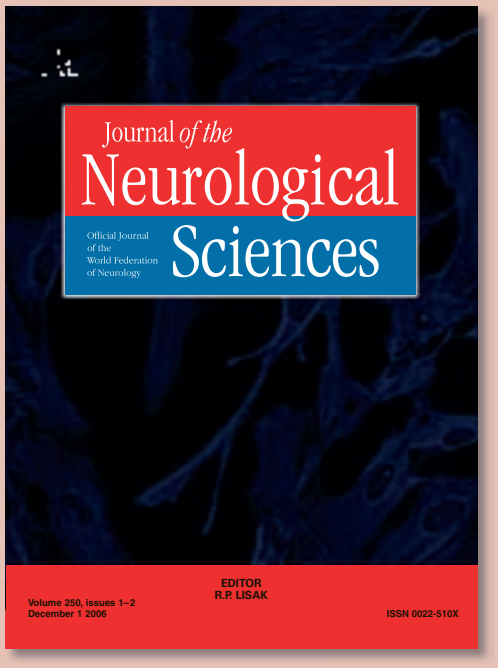

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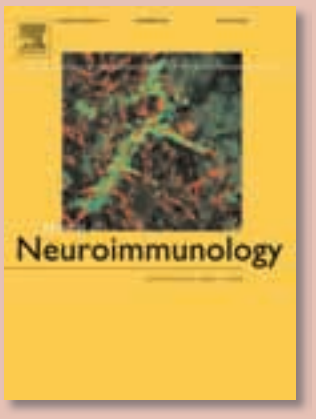

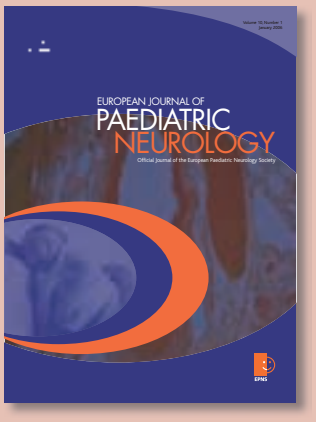

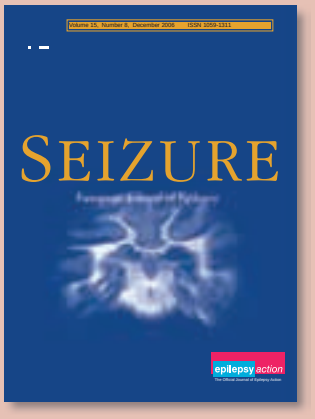

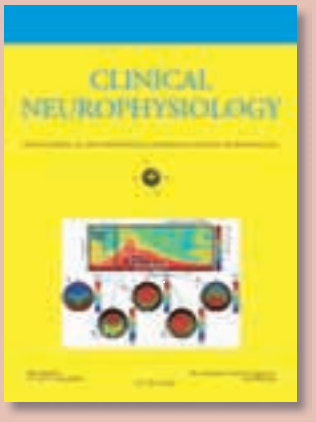

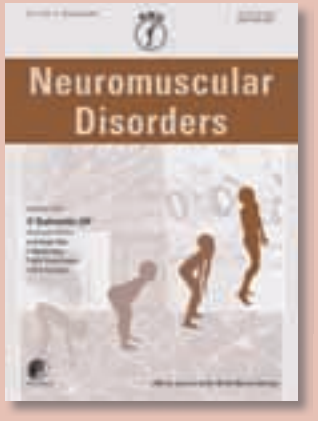

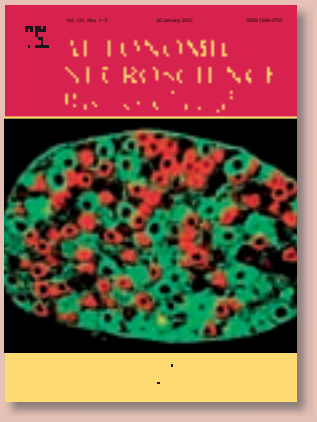

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NEUROLOGY IN PRACTICE

In South Africa, Straddling Two Worlds

The current status of neurology in South Africa is one of a dichotomy between a larger establishment of private practice–based neurologists, almost exclusively in the urban centers, and a smaller number of neurologists who are employed full time in the public sector and affiliated with universities.

The total number of neurologists in South Africa is about 130, which is a small number for a population of about 46 million people.

There are seven academic centers for neurology—at the University of the Witwatersrand in Johannesburg, the University of Pretoria, the University of Limpopo at the Ga-Rankuwa campus, the University of the Free State in Bloemfontein, the University of Cape Town, the University of Stellenbosch at Tygerberg hospital, and the University of KwaZulu–Natal in Durban.

The neurology units have relatively small staff complements—two to six full-time consultants and the same number of registrars (trainees in neurology). The status and autonomy of the academic centers vary among the centers, with some being autonomous departments and others being part of a university's department of medicine. One university—Witwatersrand—has established a neurosciences center that includes neurology, neurosurgery, ophthalmology, and otorhinolaryngology.

Most units have for several years accepted trainees in neurology from other African countries. These supernumerary registrars are supported by their country of origin and also have to pay fees to the host university. This often causes considerable hardship and appears to limit the number of potential trainees coming to South Africa.

The spectrum of neurology is remarkably varied given that it combines diseases typically seen in developed countries as well as those prevalent in developing countries, thus mirroring the status of the country.

Superimposed on this is the overwhelming AIDS pandemic, which has resulted in a large percentage of patients admitted to neurology units with AIDS-related disorders, particularly infectious disorders. A striking anomaly is the difficulty in assessing the impact of AIDS on mortality, because patients who die of HIV-related conditions cannot not be identified on death certificates as having been HIV infected.

BY PIERRE BILL, M.B. CH.B

Dr. Bill is a consultant in neurology at the Albert Luthuli Central Hospital in Durban, South Africa, and Emeritus Professor of Neurology, University of KwaZulu–Natal.

Some neurology units have been able to extend their services by making use of teleradiology facilities to assess scans that have been performed at a distance, and one unit, at the University of Stellenbosch, has incorporated telemedicine techniques for the assessment of movement disorders in patients who reside at a distance.

Two of the neurology units—the University of KwaZulu–Natal, and again, at Stellenbosch—are involved in epilepsy monitoring and epilepsy surgery.

Other common research interest areas are multiple sclerosis, infectious disorders, peripheral neuropathy, and myopathies. The small size of the units and large clinical workloads are factors that put pressure on the time available for research activity.

The Neurological Association of South Africa holds an annual congress that is well attended by local neurologists. The association also runs an annual registrar training program over 2 days during which invited speakers cover important core areas of the specialty and current issues relating to its practice. This event has grown and expanded over the years into a popular annual teaching event that is usually attached to the annual congress.

There is an increasing awareness of the need to develop closer relationships with other African countries.

I was privileged enough to be involved in the neurology examinations of the first group of trainees completing their neurology training in Ethiopia in 2008. Ethiopia can be congratulated on the high clinical standard of its neurology graduates, which bodes well for the future development of neurology in that country. They deserve every assistance and support. ■

Brain Injury Persists in Patients on Antiretrovirals

BY DIANA MAHONEY
Elsevier Global Medical News

MONTREAL — Evidence of significant brain inflammation and neuronal damage in patients with clinically stable HIV infection suggests that central nervous system injury persists despite successful viral control, Dr. Bradford Navia reported at the Conference on Retroviruses and Opportunistic Illnesses.

Dr. Navia and his colleagues in the multicenter HIV Neuroimaging Consortium used a combined imaging approach to prospectively examine the effects of HIV on brain function and identify biomarkers of risk and progression of cognitive impairment in 240 HIV-positive subjects, which they then compared with findings from 28 HIV-negative control subjects.

IT'S UNCLEAR IF THE ETIOLOGY IS RELATED TO THE EFFECTS OF HIV OR TO VULNERABILITY TO OTHER INJURIES AS A RESULT OF EARLIER INJURY.

To be included in the study, HIV patients had to have been on highly active antiretroviral therapy (HAART) for at least 1 year and their nadir CD4 count had to be less than 200 cells/mm^3.

Individuals with confounding neurological, psychiatric, or medical conditions, and those with active illicit drug use were excluded, said Dr. Navia of Tufts University in Boston.

The HIV-positive subjects were classified into three groups: 124 were neurologically asymptomatic, 66 had AIDS dementia complex (ADC) stage 0.5, and 50 had ADC stage 1-3.

The median age of the patients in the HIV group was 47 years, and the average duration of HIV infection was about 12 years.

Furthermore, the median CD4 count in the HIV group was 309 cells/mm^3, the median nadir CD4 count was 34 cells/mm^3, and the median plasma and cerebrospinal fluid (CSF) viral loads were 177 copies/mm^3 and 68 copies/mm^3, respectively.

Dr. Navia and his colleagues performed neurological, neuropsychological, and medical assessments of the subjects at baseline and again every 6-8 months, along with plasma and CSF viral load measurement and ADC staging.

In addition, they used magnetic resonance imaging and magnetic resonance spectroscopy to determine a neuronal biomarker—*N*-acetylaspartate/creatinine ratio (NAA/Cr)—and two inflammatory markers—the choline/creatinine ratio (Cho/Cr) and the myoinositol/creatinine ratio (MI/Cr)—in the basal ganglia, frontal white matter, and midfrontal cortex.

At baseline, the investigators observed that the brains of the HIV-positive patients had increased levels of inflammatory proteins, independent of cognitive status. When they were compared with subjects in the control group, the HIV-positive patients had increased MI/Cr in all three brain regions and increased Cho/Cr in the midfrontal cortex.

Over time, MI/Cr increased significantly in the HIV-positive patients' frontal white matter and the midfrontal cortex, and Cho/Cr increased significantly in the midfrontal cortex.

Among HIV-positive patients who had cognitive impairment, NAA/Cr was decreased in the frontal white matter, compared with the controls and the asymptomatic HIV patients. NAA/Cr decreased significantly over time in the frontal white matter and basal ganglia of these symptomatic patients, Dr. Navia reported.

A predictive model incorporating patient demographics and disease-specific variables identified four metabolic patterns of brain injury and ADC stage. Following logistic regression analysis, one of these patterns—basal ganglia with decreased NAA/Cr and increased Cho/Cr—emerged as a significant predictor of ADC stage 1-3.

This suggests that the brain injury process in HIV infection may have two stages, with preliminary, diffuse inflammation followed by basal ganglia disease as ADC develops, he said.

The findings suggest that diffuse inflammatory changes can occur in the brains of HIV-infected patients who were being treated with antiretroviral therapy in the absence of neurologic symptoms.

In addition, decreasing NAA/Cr in the basal ganglia is a critical event in patients with ADC "and it may provide a sensitive biomarker of the extent of structural and functional change in the brain," Dr. Navia noted.

The results appear to imply that the impairment detected in patients being threated with antiretrovirals is a consequence of ongoing HIV-related injury despite treatment rather than as a result of residual effects from earlier infection, Dr. Richard W. Price commented in an interview.

However, it is still unclear whether the etiology of the progressing impairment is "related to the effects of HIV or an increased vulnerability to other injuries as a result of earlier injury," said Dr. Price,who is professor and vice chair of neurology at the University of California, San Francisco.

"This is indeed a difficult issue to study, but approaches such as that of Dr. Navia, which use objective measures that track biological processes rather than simple outcomes on neuropsychological testing, are critical to addressing this," said Dr. Price, who was not involved in the study.

Dr. Navia reported no relevant financial conflicts of interest regarding his presentation. ■

Aphasia & Cognitive Disorders RG: Forum for Exchange

BY FACUNDO MANES, M.D.
Chair, Aphasia and Cognitive Disorders Research Group, WFN

The World Federation of Neurology Aphasia and Cognitive Disorders Research Group is a unique group of more than 150 experts in cognitive disorders. It aims to promote knowledge, awareness, and understanding of cognitive neurology and facilitate the exchange of ideas among cognitive neurologists worldwide.


DR. MANES

The group's 2008 meeting took place in Edinburgh, Scotland. Attendees represented many different countries and a range of disciplines other than neurology, such as neuropsychiatry and psycholinguistics. This range contributed to the dynamic and interdisciplinary character of contemporary aphasiology and cognitive neurology.

The success of the meeting reflected the hard work on behalf of the RGACD's former president, Dr. Argye Hillis of Johns Hopkins University, Baltimore, U.S.A., and the local organizer, Dr. Thomas H. Bak of the University of Edinburgh. At the meeting, I was elected RGACD chair, and my colleague and friend, Tom Bak, was elected cochair. We consider it an honor to be in charge of such a distinguished group and will do our best to continue the tradition established by our predecessors.

The next meeting will be in Istanbul, Turkey, May 15-18, 2010. Dr. Oðuz Tanridað of the Gulhane Military Medical Academy Haydarpasa Training Hospital in Istanbul will direct the local arrangements. The presentations will focus equally on aphasia and language research and on other cognitive disorders. We look forward to an excellent meeting, with the high level of congenial discussion that has become the hallmark of RGACD meetings.

In the next 4 years, we aim to promote the profile of cognitive neurology and to extend our activities globally, in particular, targeting younger neurologists and those in the developing world. We plan to disseminate information on the detection, treatment, and management of diverse cognitive disorders to professionals around the world. To achieve this, we plan to formulate a series of consensus guidelines on issues of practical relevance, which will be translated into different languages. We will also update the Web site and continue to develop the RGACD biennial meeting as a truly international congress. We aim to bring together the experience of the past and the energy and enthusiasm of the future. As such, we are developing a Forum of Young Researchers and have invited all former presidents to form our advisory board.

Another way for us to consolidate and expand as an international body is to establish a series of teaching courses in the developing world. This year, we endorsed the International Cognitive Neuroscience Meetings held in April in Marmaris, Turkey, the Brazilian Symposium on Frontotemporal Lobar Degeneration on Sept. 18-19, 2009, in São Paulo, and the Cognitive Neuroscience Meeting on Nov. 4 in Buenos Aires, Argentina. Next year, we plan to organize a teaching course in Eastern Europe, just before our Istanbul meeting. We hope to extend our activities to other regions such as the Indian subcontinent and East Asia. ■

DR. MANES *is the director of the Institute of Neurosciences and professor of neurology and cognitive neuroscience at Favaloro University, and director of the Institute of Cognitive Neurology, Buenos Aires, Argentina.*

Neuroprosthetics Meeting Seeks to Forge West-East Ties

BY VICTOR PIKOV, PH.D.

The first International Conference on Neuroprosthetic Devices took place in Hsinchu, Taiwan, in March. It was sponsored by the National Chiao Tung University, Taiwan's leading academic establishment in the fields of semiconductor technologies and electrical engineering.

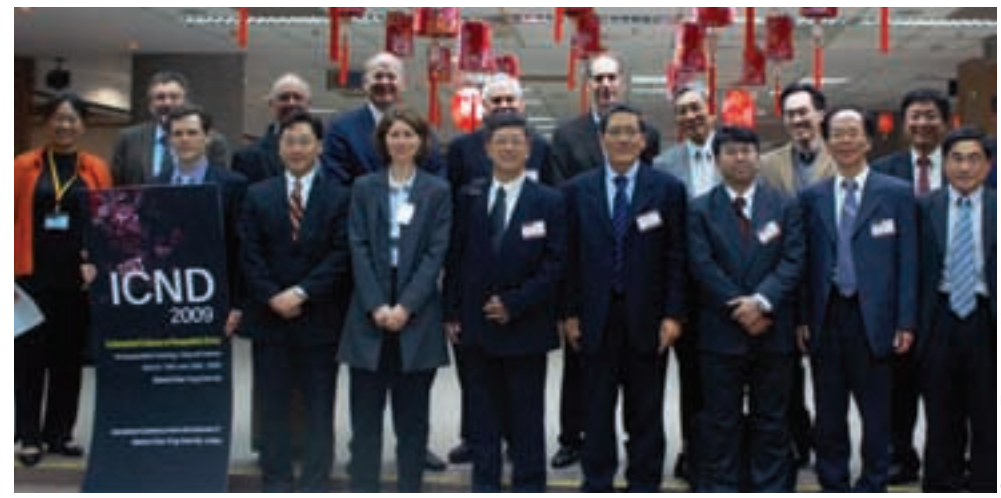
The aim of the conference was to foster East-West collaboration in the rapidly advancing clinical use of neuroprosthetics and to introduce the field of implantable devices for neurological disorders to Taiwan's engineering community.

Dr. Kendall H. Lee, a neurosurgeon from the Mayo Clinic in Rochester, Minn., U.S.A., and Kevin Bennet, chair of the clinic's division of engineering, presented their work on the development of a system called the Wireless Instantaneous Neurotransmitter Concentration Sensor for MRI-compatible measurement of dopamine, adenosine, and glutamate concentrations during the implantation of the deep brain stimulation (DBS) device. Guided with the real-time information about the neurotransmitter release near the DBS electrodes, neurosurgeons can more precisely position the electrodes and fine-tune their stimulation parameters.

Dr. Stephen Wong, a neurologist from the University of Pennsylvania, Philadelphia, U.S.A., presented a technology to assist neurosurgeons in targeting the deep brain structures. He demonstrated a novel computational process for the automated analysis of neural activity that achieves 90%-95% accuracy in detecting the subthalamic nucleus to within 0.5 mm. This approach could help reduce the risk of error among neurosurgeons and allow them to focus on other aspects of this complicated procedure.

Dr. Sydney Cash, a neurologist from the Massachusetts General Hospital and Harvard Medical School, Boston, U.S.A., described a novel use of intracortical recordings in the human brain for accurate detection and prediction of seizures. By evaluating the local field potentials and action potentials during preictal and ictal periods, he determined the signatures of seizure onset and propagation across the cortex. This information can be used for better management of epilepsy and gaining insights about epilepsy pathophysiology.

Douglas McCreery, Ph.D., a neural engineer from Huntington Medical Research Institutes, in Pasadena, Calif., U.S.A., presented two talks on the application of silicon-based stimulating microelectrodes for treatment of Parkinson's disease (PD) and deafness. In his first presentation, he described the long multisite microelectrodes that are being developed for stimulation in the subthalamic nucleus, which can provide better alleviation from the PD symptoms than do conventional macroelectrodes. Their increased effectiveness is attributed to a more precise targeting of the motor structures within the nucleus while avoiding stimulation of the limbic areas, which may affect the patient's mood and autonomic nervous system. He also spoke about silicon-based electrodes that can be implanted in the cochlear nucleus of the brainstem for restoring hearing in people with severed connections between the cochlea and the brainstem, such as the patients with removed cochlear nerves due to neurofibromatosis type 2.



COURTESY TSUNLING HO

The conference organizers and speakers are as follows: Top row, from left to right, Prof. Li-Ju Lin (NCTU), Dr. Douglas McCreery (HMRI), Prof. William Shain (Wadsworth Center), Mr. Kevin Bennet (Mayo Clinic), Mr. Harvey Wiggins (Plexon Inc.), Prof. Richard Staba (UCLA), Prof. Sung June Kim (Seoul National Univ.), Dr. Stephen Wong, (U. Penn), Prof. J. C. Chiou (NCTU); bottom row, from left to right, Dr. Victor Pikov (HMRI), Prof. Kendall Lee (Mayo Clinic), Prof. Yael Hanein (Tel-Aviv Univ.), Prof. Jiping He (Arizona State Univ.), Prof. Wentai Liu (UC Santa Cruz), Prof. Jun Ohta (Nara Inst. Science Tech.), Dr. Shih-Ching Chen (Taipei Medical Univ.), Prof. Ming-Dou Ker (I-Shou Univ.).

Prof. Sung June Kim, a biomedical engineer from Seoul (Korea) National University, described a simplified cochlear implant designed and fabricated for use in developing countries. The device was implemented with eight stimulation channels and a generic digital signal-processing chip for the processing, with a throughput of 1,000 pulses/sec per channel. It achieved performance comparable with more expensive commercial devices, with CUNY Sentence Test scores as high as 90% correct in a quiet condition.

I also made a presentation on the results from a preclinical study aimed at developing an intraspinal prosthesis for bladder voiding in spinal cord–injured patients. The array of silicon-based electrodes was implanted in the cord's sacral region to control the opening of the bladder muscle and relaxation of the external urethral sphincter. I showed the efficacy of the device for near-complete bladder emptying before as well as after a complete spinal cord injury.

Jiping He, Ph.D., a biomedical engineer from Arizona State University, in Phoenix, U.S.A., described the progress in neuroprosthetic technologies for chronic monitoring of a large number of cortical neurons in awake and functioning subjects. He showed successful real-time control of external devices by directly recorded cortical signals, such as commands for reaching, grasping, and stepping in subjects after stroke or spinal cord injury.

The speakers expressed their hopes for stronger links between Eastern and Western countries in the neuroprosthetic field. They indicated that Taiwan's position as a leader in microfabrication technologies and its recent attention to biomedical device manufacturing create a strong foundation for a large-scale effort in the neuroprosthetic device development in the country. That effort could be further strengthened by making these devices available for preclinical and clinical testing at the global community of neuroprosthetic research centers. ■

DR. PIKOV *is a neurophysiologist from Huntington Medical Research Institutes in Pasadena, Calif., U.S.A.*

Stem Cell Procedure Lowers MS Disability

BY JEFF EVANS
Elsevier Global Medical News

A nonmyeloablative approach to transplanting autologous hemopoietic stem cells in patients with relapsing-remitting multiple sclerosis appears to improve neurological deficits while potentially causing less toxicity than other transplantation methods, results of a phase I/II study show.

The procedure improved neurological outcomes in 17 (81%) of 21 patients without any deaths or nonhematologic toxicities of grade III severity or greater after a mean follow-up period of 37 months, Dr. Richard K. Burt of Northwestern University, Chicago, and his associates reported (Lancet Neurol. 2009;8:244-53).

"It's the first time that I'm aware of in a trial for MS that, rather than focusing on slowing the progression of disability, you actually reverse it," Dr. Burt, chief of the division of immunotherapy for autoimmune diseases at the university, said in an interview.

Previous studies of autologous hemopoietic stem cell transplantation and other immune-based therapies have not been effective in reversing the neurological deficits in late secondary-progressive multiple sclerosis (MS) that are caused by axonal atrophy and neurodegeneration. The toxicity of myeloablative transplantation techniques in these studies has limited clinicians' enthusiasm for the procedure because of its unacceptably high rate of transplantation-related death.

The results of the current study are "very encouraging" because it has not been "clear what conditioning approach is the best to use," said Dr. Jeffrey Cohen, director of the Experimental Therapeutics Program at the Cleveland Clinic's Mellen Center for Multiple Sclerosis in the U.S.A. He cautioned that the results will need to be confirmed in a randomized trial, noting that it is not entirely clear how the use of alemtuzumab as a part of the conditioning regimen for transplantation in most of the patients could have influenced the results of the study since the biologic is a potent treatment for MS on its own. Dr. Cohen disclosed that he has served as a paid consultant or speaker for Biogen Idec, Genzyme Corp., Sanofi-Aventis U.S. Inc., and Teva Neurosciences Inc.

Dr. William M. Carroll of the department of neurology at Sir Charles Gairdner Hospital, Perth, Australia, noted that if the treatment continues to have a low risk of serious side effects in larger studies, it "might be offered early in aggressive MS." However, these additional studies will need to address the risk of immune reconstitution after autologous hemopoietic stem cell transplantation as well as "quantitate the relative contributions of the induction regimen" (including alemtuzumab) and the immune rest mechanism, he said in an interview.

Dr. Burt and his colleagues already have set out to prove whether the benefits of the nonmyeloablative approach truly outweigh its risks in the ongoing Multiple Sclerosis International Stem Cell Transplant (MIST) trial. This multicenter, randomized trial of patients with relapsing-remitting MS who have failed interferon therapy is comparing the nonmyeloablative approach to autologous hemopoietic stem cell transplantation with standard of care treatments approved by the U.S. Food and Drug Administration.

In the study, the patients' median age was 33 years; median disease duration before transplantation was 5 years; and median baseline Kurtzke expanded disability status score (EDSS) was 3.1 (range, 2-5.5). The scores improved by 1-1.5 points in seven patients, by 2-2.5 points in six patients, and by 3 or more points in four patients. Of the four patients who did not have a decline in EDSS of at least 1 point, two had an improvement of 0.5 points and another two had no change in score. The neurologic improvements were correlated with improvement in quality of life.

No patient experienced disease progression, defined as a rise in EDSS of at least 1 point. After a mean of 3 years of follow-up, all signs of disease activity were absent in 13 (62%) of the 21 patients. Three patients had an increase in the number of nonenhancing T1 and T2 lesions between baseline and the most recent follow-up without having a clinical relapse or an increase in the number of gadolinium-enhancing lesions. No gadolinium-enhancing lesions were detected on any of the posttransplantation scans that were taken in patients who did not relapse.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Dr. Richard K. Burt and his colleagues found a nonmyeloablative regimen that reversed disability with relative safety in patients with relapsing-remitting MS.

Clinical relapse occurred in five patients at a mean of 11 months after transplantation (range of 6-16 months) after they had first experienced some improvement in neurologic function. Of those five patients, three had new gadolinium enhancing lesions.

"Because immune reconstitution is still being evaluated in these patients, improvements might have been related to either immune reset or transient immune suppression without regeneration of an immunologically distinct immune system. Although further studies are needed, immune reset seems probable, owing to the duration of ongoing improvement after transplantation," wrote the authors.

The nonmyeloablative conditioning regimen for the first 17 patients involved cyclophosphamide and alemtuzumab, whereas the next four patients received cyclophosphamide and rabbit antithymocyte globulin, after the Food and Drug Administration reported that alemtuzumab was associated with a blood-clotting disorder called thrombocytopenic purpura, according to Dr. Burt and his colleagues.

Both conditioning regimens provided similar results, except that two patients who received alemtuzumab developed immune thrombocytopenic purpura, which resolved after they underwent immunosuppressive therapy. Few early or late opportunistic infections developed, including one probable contaminant-related case of coagulase-negative staphylococcus, two cases of dermatomal zoster, and one case of *Clostridium difficile*–associated diarrhea. Five patients experienced neutropenic fever without the identification of any pathogen.

The researchers had no conflicts of interest to disclose and received no funding outside of Northwestern University for the study. ■

Neuropathology RG: Prioritizing Practice and Research

BY FELIX CRUZ-SÁNCHEZ, M.D.
Chair, Neuropathology Research Group, WFN

Neuropathology is the science that studies the nervous system's morbid processes. The Neuropathology Research Group of the World Federation of Neurology has been active since the federation was established in 1957, and over the years has been chaired by esteemed neurologists such as Ludo van Bogaert and Jorge Cervós-Navarro.

At the last World Congress, which was held in Sydney, Australia, in 2005, the Research Group organized a workshop to update delegates on developments in neuropathology, covering topics such as neurodegenerative diseases and muscle or brain tumor pathology. The workshop culminated with a joint activity during which participants could present case studies and discuss current issues pertinent to clinical neuropathology.

This year, at the World Congress in Bangkok, Thailand (Oct. 24-30), the Research Group again plans to invite the international community of neurologists, neuropathologists, and neuroscientists to participate by presenting their research findings and relevant cases.


DR. CRUZ-SÁNCHEZ

The Research Group is also organizing a meeting in Sucre, Bolivia, in November this year, to update Spanish-speaking countries on emerging concepts in clinical neuropathology. The meeting is being coordinated by Prof. Dr. J. V. Lafuente of the University of the Basque Country, in Bilbao, Spain.

In Europe, neuropathology is emerging as a strong and active discipline thanks to the efforts of the European Confederation of Neuropathological Societies (EURO-CNS), which is an umbrella organization for societies in the member countries of the European Union.

The first European congress in neuropathology was held in Vienna, Austria; and subsequent gatherings have been held in the cities of Warsaw (Poland), Verona (Italy), Berlin (Germany), Paris (France), Barcelona (Spain), Helsinki (Finland), and Amsterdam (Holland). Last year, the Research Group's congress was in Athens, Greece, and the next congress will be held in Edinburgh, Scotland, in the spring of 2011. Other activities that are being planned by EURO-CNS include an annual course on neuropathology and a book that will be published on the confederation's Web site.

The confederation's official journal is Clinical Neuropathology, and all members of the international community are invited to submit their research findings for publication.

We endeavor to promote the field of neuropathology by improving the quality of clinical practice and encouraging research.

DR. CRUZ-SÁNCHEZ *is chair and full professor of neurology and director of the Institute of Neurological and Gerontological Sciences at the International University of Catalonia in Barcelona.*

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OBITUARIES

John Menkes (1928-2008)

BY S. ROBERT SNODGRASS, M.D.

John H. Menkes, the internationally known child neurologist, died of cancer in Los Angeles, U.S.A., on Nov. 22, 2008.

In 1974, he published "Textbook of Child Neurology," which helped bring metabolic and genetic issues into mainstream neurology, promoting the new neurology while trying to preserve clinical skills.

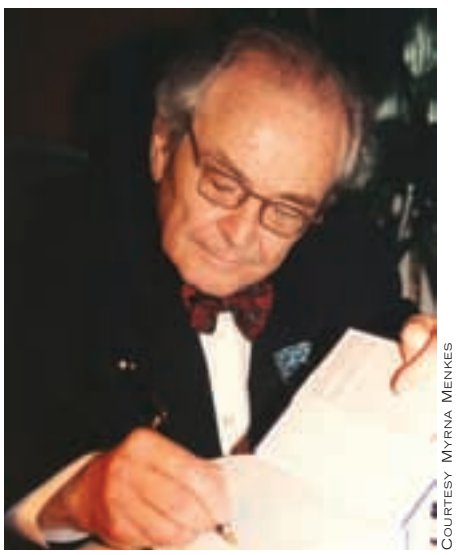
Dr. Menkes was noted for his ability to integrate chemistry, genetics, and classical neurology. While he was a pediatric resident, he described maple syrup urine disease, an inherited metabolic disorder of progressive neurologic degeneration resulting from the body's inability to break down certain amino acids. He later also described Menkes syndrome (kinky hair disease), another congenital metabolic disorder that affects copper levels in the body and that also has neurologic implications. His 1999 papers, "Menkes Disease and Wilson Disease: Two Sides of the Same Copper Coin," illustrated his synthesis of metabolism and neurology.

Two neurologists played key roles in advances in child neurology at the turn of the last century: Bernard Sachs in New York and Frederick Batten in London. Each described forms of amaurotic family idiocy, with little understanding of their mechanism or possible treatment. Dr. Sachs had lasting influence, because of his 1895 book, "A Treatise on the Nervous Diseases of Children for Physicians and Students" and his role in many medical and neurologic associations, and as founder of the division of child neurology at the Neurological Institute of New York, U.S.A., in 1934. Dr. Menkes was a product of the institute, where he trained under Sidney Carter.

Dr. Menkes was born in Vienna, Austria, in 1928, and as a young child, his parents fled with him to Ireland to escape the Nazis. The family moved to Southern California, where he obtained his undergraduate and master's degrees in organic chemistry from the University of Southern California in Los Angeles before entering medical school at Johns Hopkins University in Baltimore, U.S.A.

After graduating from Johns Hopkins in 1952, Dr. Menkes went to Boston Children's Hospital in Massachusetts, U.S.A., to complete a residency in pediatrics. He began child psychiatry training, but it was interrupted by the draft. He continued with child psychiatry in the military, though it was around that time that he decided to pursue his interest in neurology instead.

He completed his training in pediatric neurology in 1960 at the Neurological Institute of New York of Columbia-Presbyterian Medical Center and then returned to Johns Hopkins, where he learned much from David Clark and whom he succeeded in 1964 as chief of child neurology. Two years later, Dr. Menkes returned to California, where he established the child neurology division at the University of California at Los Angeles (UCLA).



COURTESY MYRNA MENKES

Dr. Menkes integrated chemistry and genetics into mainstream neurology.

He was never entirely comfortable operating within organizations and the role of division chief and the constraints and politics of academic medicine chafed him. But he remained involved at UCLA and in California pediatric neurology from a private office in Beverly Hills. He retained a life-long interest in movement disorders and played an important role in the U.S.-based Dystonia Medical Research Foundation.

Dr. Menkes was an urbane central European intellectual with a range of talents and interests in the arts literature, music, philosophy, as well as the sciences. He was a meticulous and diligent author. For his textbook on pediatric neurology, for example, he wrote many of the chapters himself and carefully edited the chapters submitted by other authors such that it was a labor of love for him. In addition, he was the author of three novels and three plays. One of these works, a 1986 Holocaust drama titled "The Last Inquisitor," won the prestigious Drama-Logue Award. Dr. Menkes, who had wanted to be a journalist but was persuaded by his father to pursue medicine, ranked with other "literary neurologists" such as Silas Weir Mitchell and Oliver Sachs. Although his novels and plays were not as financially successful, they were a satisfying outlet for his creativity. He owned a house in Wales and retreated there for extended periods of writing.

Dr. Menkes never lost interest in clinical neurology and in puzzling cases. Later in his career, he was an expert witness for the plaintiffs in many trials involving alleged obstetrical and vaccine-induced injuries. Although that pursuit angered many of his professional colleagues who felt it was not constructive, their respect for his contributions to the practice of neurology and his academic and creative writing ventures never waned. ■

DR. SNODGRASS is in the departments of pediatrics and neurology at Harbor-UCLA Medical Center in Torrance, California, U.S.A., and the David Geffen School of Medicine at UCLA.

George Karpati (1934-2009)

BY SALVATORE DIMAURO, M.D.

As news of the death of Dr. George Karpati spread through the academic world, a new thoughtful and thought-provoking article of his had just appeared in the Annals of Neurology and his colleagues were talking about how they had participated in his weekly muscle conference on the very day he passed away.

Just like George: Active to the very end. I like to think that he would have chosen to go that way—on the ramparts and in the thick of life and work.

Dr. Karpati was born in Debrecen, Hungary, in 1934 and fled his country during the Soviet occupation of 1956. He found refuge in Canada, where he completed his medical education at Dalhousie University in Halifax, Nova Scotia. After postdoctoral training at the Montreal Neurological Institute (MNI) at McGill University in Montreal, Quebec, the Henry Ford Hospital in Detroit (U.S.A.), and the National Institutes of Health in Bethesda, Md. (U.S.A.), he joined the faculty at the MNI, where he spent the rest of his career and held the Izaak Walton Killam Chair of Neurology.

COURTESY ALAIN DESILETS

Dr. Karpati was an astute clinician and world leader in neuromuscular diseases.

In line with the Hungarian tradition of excellence in myology, Dr. Karpati dedicated the best part of his career to research in neuromuscular diseases and became a world leader in the field. He was an astute clinician, a superb morphologist, and an intrepid experimentalist. His contributions were both innovative and multidisciplinary, but it is fair to say that much of his interest in recent years was focused on therapeutic approaches, and especially on the promise—and challenges—of gene therapy for Duchenne's muscular dystrophy (DMD). I remember his contagious enthusiasm in trying to devise a gene therapy for myophosphorylase deficiency (McArdle disease) in vitro as a stepping stone to the more complex gene replacement in DMD.

Consistent with his extroverted personality and healthy sense of humor, Dr. Karpati was a great communicator and a masterful lecturer. He mentored innumerable neuromuscular specialists and was—and will continue to be—a wonderful role model to many young clinicians and investigators.

He received numerous honors from his adoptive country, including the Order of Canada, the Ordre Nationale du Québec, and the Wilder Penfield Award (Prix du Québec). He was a member of the Royal Society of Canada and the Canadian Academy of Health Sciences and recipient of a lifetime achievement award in neuromuscular research from the Muscular Dystrophy Association of Canada. He also received a lifetime achievement award from the World Federation of Neurology and an honorary doctorate from the University of Marseilles (France). At the time of his death, he was one of the 35 principal investigators in the Canadian Network of Excellence dedicated to stem cell research.

In addition, he was honored by his native country, where he was made a member of the Hungarian Academy of Sciences and received a doctorate honoris causa from the University of Debrecen.

If Dr. Karpati's death was quick and perhaps as he would have preferred—at the peak of an active career—the loss to his family and friends was immense, nevertheless. To Shira, his wife of 42 years, and his sons, Adam and Joshua, go heartfelt sympathy and the loving solidarity of his colleagues and admirers from around the world. ■

DR. DIMAURO is the Lucy G. Moses Professor of Neurology at Columbia University Medical Center, New York, U.S.A.

The article by DR. KARPATI that is mentioned above was published in the January 2009 issue of the Annals of Neurology (2009;65:7-11).

PROFILE

Niphon Poungvarin, M.D.

BASED ON AN INTERVIEW WITH DR. POUNGVARIN

President of the 19th World Congress of Neurology in 2009

Professor Niphon Poungvarin was born in 1951 and received his medical degree in 1974 from Mahidol University in Bangkok, Thailand. He was granted the King's scholarship and completed his postgraduate training in medicine at The Royal Victoria Infirmary, Newcastle Upon Tyne (England), under Professor D.N.S. Kerr.

In 1978, after obtaining Membership of the Royal Colleges of Physicians in the United Kingdom, he trained in neurology under David Shaw, David Bates, N.E.F Cartilage, and Lord John Walton, a previous president of the World Federation of Neurology. He returned to Thailand in 1981.

Professor Poungvarin received a grant from the Rockefeller Foundation to train in clinical epidemiology at the University of Newcastle in New South Wales, Australia, under Professor Stephen Leeder. In 1987, Professor Poungvarin and his colleagues published a landmark paper on the effect of dexamethasone in primary supratentorial intracerebral hemorrhage (N. Engl. J. Med 1987;316:1229-33). Since then, steroids are no longer used in hemorrhagic stroke.

DR. POUNGVARIN

Professor Poungvarin has been professor of neurology since 1991, the same year he was made a Fellow of the Royal College of Physicians by the Royal College of Physicians of London. Three years later, he was awarded the prestigious title of Fellow of the Royal Institute of Thailand for excellence in research.

He has received numerous other awards in recognition of his research and service during his 25 years at Mahidol University, including the Mahidol Award for Research, the Best Clinical Teacher in the Faculty and Excellent Teacher of the University, and the Best Government Officer of Mahidol University for 9 consecutive years since 1999.

Professor Poungvarin's main areas of interest are stroke, epidemiology, dementia, parkinsonism, and botulinum toxin therapy, which he introduced as a treatment in Thailand a year before it was approved by the U.S. Food and Drug Administration in 1989.

Together with Dr. Allan B. Scott of San Francisco, U.S.A., he had conducted a double-blinded study in Thai subjects on the use of botulinum toxin for hemifacial spasm, and it was those findings that were submitted to the FDA for approval of botulinum toxin injection for hemifacial spasm. Professor Poungvarin has written 145 chapters of books and textbooks and published more than 390 publications in both local and international journals.

Recently, he was honored by the Indian Academy of Neurology, which bestowed upon him a lifetime achievement award for his contributions to the field of neurology worldwide.

He is currently involved in several editorships on local and international journals, including Lancet Neurology, Practical Neurology, Archives of Neurology, The International Journal of Stroke, Parkinsonism and Related Disorders, Asian Journal of Neurology, The Journal of the Medical Association of Thailand, Journal of the Royal Society, and the Siriraj Hospital Gazette. Professor Poungvarin is also a well-known and sought-after speaker in Asia and has spoken at numerous international conferences and meetings.

In 2005, Professor Poungvarin led the successful bid for the 19th World Congress of Neurology to be held this year in Bangkok, Oct. 24-30. Other Asian countries to have hosted the congress are Kyoto, Japan, in 1981, and New Delhi, India, in 1989.

The scientific sessions and education programs are now finalized under his leadership and are set to make the WCN 2009 one of the best neurology conferences ever.

Professor Poungvarin and his organizing team invite neuroscientists from all over the world to join this magnificent meeting in Bangkok.

For more information, go to www.wcn2009bangkok.com. ■

NEUROLOGICAL STORY

Oddities, Flashbacks, and a Couple of Syndromes

When I reflect on my life, I am often struck by how serious clinical work and research and lighter, everyday events can sometimes be so closely intertwined.

In my day, Australians had to go to London's Queen Square, now known as the National Hospital for Neurology and Neurosurgery, to train in neurology. I had to meet with each of the neurologists on the selection committee, and I can recall trudging in the snow to visit them in their consulting rooms on Harley and Wimpole streets, from the austere rooms of Sir Charles Symonds, as befitted the Sherlock Holmes–type reputation of the doyen of neurologists, to those of Dr. J. St. C. Elkington, which were part of his elegant house, with the waiting room in his impressive library.

I subsequently had the pleasure of attending Sir Charles' last ward round, and was house physician for Sir Francis Walshe, which was always a joy because of his dry wit. On one occasion, he was frustrated in his examination of an elderly woman's palate because her upper dentures kept dropping down and obscuring his view. "Observe the portcullis effect," he remarked to the surrounding entourage.

On my return to Australia, I became an honorary assistant physician (we weren't allowed to call ourselves neurologists) at Sydney Hospital and was appointed superintendent of the Northcott Neurological Centre. At Northcott, I got to work with Dr. George Selby, a superb clinical neurologist and major figure in the development of neurology in Australia. We analyzed the characteristics of migrainous patients and wrote a paper in which we mentioned allodynia, which is now undergoing a revival as one of the symptoms of migraine.

Also at Sydney Hospital, I investigated a family in which four members had myoclonic epilepsy. Not only did they have myoclonus on any attempted movement but they were also subject to sudden drop attacks in which they lost all postural control and fell unless supported. Later, in 1960, while I was on a traveling fellowship at the neurology department at the Massachusetts General Hospital in Boston, U.S.A., Dr. Raymond Adams asked me to work out the pathophysiology of myoclonic jerks and falling attacks in his patients with posthypoxic myoclonus—subsequently known as Lance-Adams syndrome. It had a similar symptom complex to the familial myoclonic epilepsy in the family in Sydney, and my investigation helped me understand what caused the myoclonic falling attacks.

While I was in the United States, Dr. Robert Schwab allowed me access to his Parkinsonian patients, and I was able to solve something that had puzzled me for years. When patients had a typical resting tremor it was understandable that the cog-wheel rigidity would have the same frequency as the resting tremor, but I couldn't fathom why patients with no obvious resting tremor often still had marked cog-wheel rigidity. I found that patients without any resting tremor had a markedly augmented action tremor when fully contracting their muscles. The cog-wheel rigidity was then at the higher frequency of the action tremor. This is useful clinically, because a patient with no resting tremor who may not be swinging one arm as well as the other may have a marked action tremor on the affected side, thus confirming the diagnosis of early Parkinson's disease.

BY JAMES W. LANCE, M.D.

Dr. Lance is honorary consultant neurologist at the Institute of Neurological Sciences at Prince of Wales Hospital and Emeritus Professor of Neurology at the University of New South Wales, in Sydney, Australia.

I have been blessed with having had the world's best secretaries in my lifetime, and thanks to one of them, I was able to document a new syndrome. I had just seen a teenage boy who had experienced a pain behind one ear associated with a twisting sensation in his tongue on the same side when he rotated his neck sharply. I told my secretary that I seemed to recall a similar case. "Oh, yes," she replied, "you saw the son of Mrs. Mac, a physiotherapist, about 15 years ago." She had his records on my desk that day. A few weeks later, she telephoned me to ask if I would fit in an extra patient. I hesitated. "You won't object to seeing this one," she said, "he is a boy who gets a pain in the back of his head and feels numb in one half of his tongue when he twists his neck suddenly." I agreed, heeding the adage that one case is interesting, two is a coincidence, and three is a paper. And a paper it was: Dr. Michael Anthony contributed another patient when we described the mechanism of the neck-tongue syndrome.

Then there are those rare cases whose solution is even more circuitous. If a patient did not fit neatly into a diagnostic box, I would tuck away the records in an "interesting patients" file. Then I would present whatever information I had at neurological meetings and ask my colleagues to send me details of any patients with similar conditions. This was productive in studying conditions such as visual hallucinations, the Harlequin syndrome, and the red ear and "blip" syndromes.

After over 50 years of practice, I still see patients with symptoms I've not previously encountered. Such is the complexity and excitement of the discipline in which we are privileged to serve. ■

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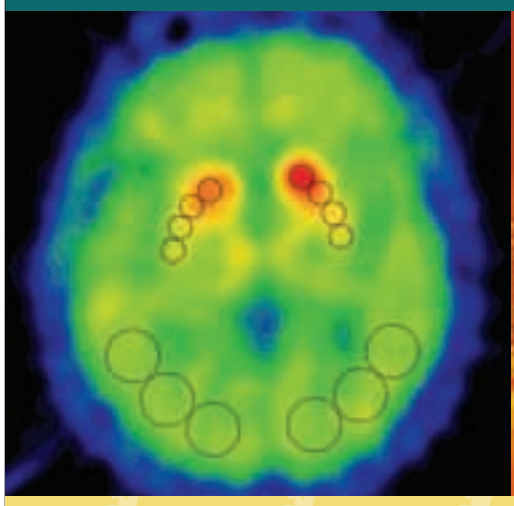

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