TEXAS NEUROLOGICAL SOCIETY WINTER 2009

Broca's Area

The Voice of Texas Neurology

President's Message

William S. Gilmer, MD

January 20, 2009, Inauguration day. As I write this evening, we have a new president moving in a new direction with a new set of ideas. The 81st Texas Legislature has already been in session one week, with its own new leadership set to address as many as 10,000 pieces of legislation, with 9 billion dollars less to spend than expected. TMA is actively tracking up to 3,000 bills that directly affect the practice of medicine. The next 140 days will be a wild ride in Austin.

On a personal note, thank you to Dr. Bob Fayle, Program Director, who put together a great 2008 Summer CME Conference in San Antonio this past July. Together with Education Committee Chair, Jerry Bettinger, Preston Harrison, Tommy Yee and Alan Halliday, the program focused on practical but challenging clinical problems including migraine, chronic daily headache, fibromyalgia and culminated in a fantastic 3 hour live demonstration-workshop by Jun Kimura on EMG and NCS procedures. Special thanks to Doug Hudson, longtime friend of Dr. Kimura for inviting him.

Thanks to Randy Evans for bringing new features to Broca's Area including Broca's Bios, Expert Opinions, case studies, as well as news and information for Texas Neurologists.

TNS is represented well throughout the year. Rachael Reed, executive director, and I participated in the 3rd annual AAN State Society Roundtable in September. Joined by 23 other states, we shared ideas on how to make our societies better, including membership recruitment, liability and advocacy issues, and funding challenges. Dr. Hudson and I represent Neurology at the TMA InterSpecialty Society Committee where we try to develop consensus around issues important to the House of Medicine. Dr. Maureen Wooten Watts represents Texas Neurology at the Medicare Trailblazer Carrier Advisory Committee, which sets policy for Medicare coverage issues critical to our patients. TNS is a member of the PatientsFirst Coalition, which seeks to protect patients from those who would seek to practice medicine without having gone to medical school. We have joined other specialties in the Imaging Alliance to assure open access and uniform standards to imaging facilities for our patients.

TNS continues to grow; we are well over 500 members strong. We have increased participation of residents and fellows "Your Future Partners" and academic neurologists from around the state. Our web site is being completely revised to make it easier and more useful, including online registration for meetings and online renewal of membership. Our directory continues to be a valuable resource, listing Texas neurologists by name and practice location. We are exploring new ways to make our sections (Coding

(Continued on page 2)

Mark Your Calendar

2009 Summer Conference
July 17-18
Hyatt Lost Pines
Bastrop/Austin

2010 Winter Conference
February 5-7
Austin Hyatt

2010 Summer Conference
July 23-24
JW Marriott
San Antonio

2011 Winter Conference
February 25-27
Austin Hyatt

Visit TNS online at texasneurologist.org

President's Message *(continued)*

— Dr. Black, Stroke — Dr. Glusman, Sleep — Dr. Hudson, Headache — Dr. Loftus, Neuromuscular — Dr. Shaibani) more valuable and useful.

Thank you for a wonderful year as your President. I will continue to represent Neurology on the executive board of BrainPAC (AAN's political action committee), TexPAC at TMA and as President-elect of Harris County Medical Society. We gratefully appreciate your support and extend the invitation to contact me, Rachael Reed, or your incoming 2009 president Alan Halliday if you would like more information about participating at any level at TNS. This is your organization and we would love for you to share the enthusiasm that surrounds us.

TEXAS NEUROLOGICAL SOCIETY

12th Annual Winter Conference

FEBRUARY 27 – MARCH 1, 2009
HYATT REGENCY AUSTIN

Educational Program jointly sponsored by the Texas Medical Association and the Texas Neurological Society.

Winter Conference Preview

Mark you Calendar for our 12th Annual Winter Conference, which will be held in Austin, February 27 – March 1, 2009. You can earn 18 hours of CME, including ethics. Go to the TNS website at www.texasneurologist.org for more information.

Program director, Jerry Bettinger, MD, has planned an impressive program. Marvin Fishman, MD and Gary Clark, MD have planned another terrific Pediatric Neurology session.

Friday's Welcome Reception will be held in the beautiful Foothills room, overlooking Lady Bird Lake and downtown Austin. Saturday's business luncheon will feature the presentation of the Lifetime Achievement Award and the change of TNS officers.

On Friday and Saturday night, your evenings are free to go explore Austin. Go to www.austintexas.org for information on restaurants and other entertainment venues.

TNS Gratefully Thanks the Supporters of the 2008 Summer Conference

DIAMOND SUPPORTER
Teva Neuroscience

GOLD SUPPORTERS
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Austin Radiological Association
Biogen

A special thanks to Cadwell Labs for providing the equipment for the EMG demonstration on Saturday.

IF YOU CERTIFIED IN 1998...
Apply for MOC examination in 2007.
Requirements: 60 Category 1 CME credits

IF YOU CERTIFIED IN 1999...
Apply for MOC examination in 2008.
Requirements: 90 Category 1 CME hours

IF YOU CERTIFIED IN 2000...
Apply for MOC examination in 2009.
Requirements: 120 Category 1 CME hours

IF YOU CERTIFIED IN 2001...
Apply for MOC examination in 2010.
Requirements: 150 Category 1 CME hours
1 completed self-assessment activity

IF YOU CERTIFIED IN 2002...
Apply for MOC examination in 2011.
Requirements: 180 Category 1 CME hours
1 completed self-assessment activity

IF YOU CERTIFIED IN 2003...
Apply for MOC examination in 2012.
Requirements: 210 Category 1 CME hours
1 completed self-assessment activity

IF YOU CERTIFIED IN 2004...
Apply for MOC examination in 2013.
Requirements: 240 Category 1 CME hours
2 completed self-assessment activities
1 completed PIP unit

IF YOU CERTIFIED IN 2005...
Apply for MOC examination in 2014.
Requirements: 270 Category 1 CME hours
2 completed self-assessment activities
1 completed PIP unit

IF YOU CERTIFIED IN 2006...
Apply for MOC examination in 2015
Requirements: 300 Category 1 CME hours
2 completed self-assessment activities
2 completed PIP units

IF YOU CERTIFIED IN 2007...
Apply for MOC examination in 2016
Requirements: 300 Category 1 CME hours
2 completed self-assessment activities
3 completed PIP units

IF YOU WILL BE CERTIFIED IN 2008...
Apply for MOC examination in 2017
Requirements: 300 Category 1 CME hours
2 completed self-assessment activities
3 completed PIP units

Maintenance of Certification

By Mark Pretorius, MD, FAAN

Certification by one of the 24 Member Boards of the American Board of Medical Specialties (ABMS) is widely used as an indicator of higher standards and better care. In March 1998, ABMS created the Task Force on Competence. As part of its work, the task force identified core competencies for physicians specifying the same six core competencies as those developed by the Accreditation Council for Graduate Medical Education (ACGME) and proposed the Maintenance of Certification (MOC) program. The MOC had four key components: Part 1—professional standing; Part 2—lifelong learning and self-assessment; Part 3—cognitive expertise; and Part 4—practice performance assessment. Parts 1 and 3 incorporate existing requirements (licensing and a regular examination), whereas Parts 2 and 4 are new and focus on continual learning and competency in practice. A number of the tools used to fulfill MOC are applicable to both Parts 2 and 4. However, for Part 4, certified physicians must demonstrate with data that they can assess the quality of care they deliver and demonstrate they can use improvement principles to improve care. Each Member Board determines what tools should be used to best meet the requirements of MOC in its given specialty and subspecialty areas of practice.

Neurologists seeking MOC through the American Board of Psychiatry and Neurology (ABPN) are required to participate in at least two self-assessment activities (Part 2) in a 10-year period, one each in years 1–5 and 6–10. An example of an acceptable self-assessment is Quintessentials from the American Academy of Neurology, which includes home tests on dementia, epilepsy, neuro-otology, and migraine headache. ABPN diplomates also must earn 150 specialty-specific Category 1 CME credits in years 1–5, and 150 in years 6–10. Part 4 requires three performance in practice modules be completed in a 10-year cycle—the first activity to be completed in years 1–3, the second to be completed in years 4–6, and the third to be completed in years 7–9. Each module is divided into two units: a clinical module, which includes chart reviews, and a feedback module, which consists of patient and/or peer review.

As of October 1, 1994, all individuals achieving Board certifications by the ABPN were issued 10-year, time-limited certificates. Certificates issued in the subspecialties of addiction psychiatry, clinical neurophysiology, forensic psychiatry, geriatric psychiatry, hospice and palliative medicine, neurodevelopmental disabilities, neuromuscular medicine, pain medicine, psychosomatic medicine, sleep medicine, and vascular neurology, including those issued prior to October 1, 1994, are 10-year, time-limited certificates. Time-limited certificates for child and adolescent psychiatry began in 1995. All ABPN time-limited

certificates, regardless of their exact dates of issuance, are considered to expire 10 years later on December 31. Diplomates who are not recertified before their certificates expire are no longer Board certified in that area of certification. Once a former diplomate completes all MOC requirements and passes the MOC examination, however, he or she will regain certification status.

Diplomates of the ABPN are required to maintain records of their self-assessment and Continuing Medical Education (CME) activities, and Performance in Practice (PIP) modules. Diplomates must provide their signature attesting to completion of these activities (as determined by the phase-in schedule) on their applications for the MOC examinations. The MOC Program will be fully operational in 2016 at which time attestation to all components will be required on applications for the MOC examinations. (See table for implementation schedule)

I encourage you to visit www.abpn.com for further details with regard to MOC requirements. This is a complicated program and all of the details cannot be covered in this brief newsletter. Board certification may be a requirement for you to retain staff privileges at many hospitals, and it may be a requirement for you to be a provider on many health insurances plans. Many issues referenced in this article come directly from the website noted above or from other AAN publications. These issues are addressed in detail in several recent articles; Horowitz S. NEUROLOGY 2008;71:605-609, Corby J. NEUROLOGY 2008;71:544-545,and Faulkner, L. NEUROLOGY 2008;71:599-604.

Members in the News

William H. Fleming III, MD, of Houston will be installed as Texas Medical Association president during TexMed 2009 this May in Austin. Dr. Fleming is a past president of TNS.

TNS member **Randy Light, MD's** photograph of an evening on Lake McDonald in Glacier National Park was the winning entry in the *Austin American-Statesman's* Travel Win-in-a-Flash contest. Dr. Light took the photograph during a family trip to Montana in July. Light's photo, one of 381 entries in the summer travel category, was selected by readers and Statesman photo editor Nell Carroll as the best submitted.

"The water in the lake is just lovely, and then you had that nice evening lighting that produced highlights and shadows on the mountains," Light says. "It was a momentary opportunity."

The image "has a natural beauty to it that is timeless," Carroll says. "Certainly the reflection of the mountains in the water makes a lovely image on its own, but the ripple in the foreground distorting the reflection makes the picture special to me. The ripple invites readers to imagine what made the ripple: a boat, fish or bear, who can say?"

Expert Opinion #1

Mike Singer, M.D., Ph.D., Assistant Professor of Neurology
University of Texas Southwestern Medical Center
Supported by NIH CTSA Grant UL1 RR024982

Case:
A 60 year-old woman has a 1 year history of fairly constant numbness and tingling of the entirety of both feet at times going up to the ankles. At night, she may have a mild burning sensation in the feet. She has a past medical history of only hypertension on amlodipine. Neurological examination is normal except for distally diminished pin prick and vibration in both lower extremities. Deep tendon reflexes including ankle jerks are 2+ and symmetric.

Questions:
What diagnostic testing would you recommend? What is the yield? If the blood tests are normal, what is the most likely diagnosis? How often are the deep tendon reflexes normal? How often do the hands become symptomatic and when might spread occur?

Discussion:
The patient presents with symptoms typical of chronic distal symmetric polyneuropathy. After excluding a mimicking CNS disorder, evaluation turns to ascertaining the etiology of the polyneuropathy. Neurologists well know that the list of potential causes -- many of which are treatable -- is extensive, and includes nutritional, metabolic, toxic, infectious, autoimmune, and genetic illnesses. The work-up therefore can be both daunting and expensive. The American Academy of Neurology recently released a practice parameter which utilizes available evidence to help guide this process (England et al, 2009).

Following a detailed history (including extensive family history) and neurologic examination, patients should undergo nerve conduction studies and blood tests. The following blood tests are recommended for all patients: complete blood count, erythrocyte sedimentation rate, complete metabolic panel (including glucose, renal, and liver tests), thyroid function tests, vitamin B12 level (including the metabolites methylmalonic acid and homocysteine), and serum protein electrophoresis with immunofixation (SPEP/IFE). Of these, the highest yield according to the AAN practice parameter are glucose, vitamin B12, and SPEP/IFE. When vitamin B12 levels are in the low-normal range (200-500 pg/ml), elevated methylmalonic acid or homocysteine can indicate a functional deficiency of vitamin B12. The most sensitive test for identifying prediabetes or diabetes is the 2-hour oral glucose tolerance test, which may detect impaired glucose tolerance even when hemoglobin A1c is normal (Smith and Singleton, 2004).

Should these results prove unrevealing, further testing for less-common etiologies may be performed according to the judgment of the clinician. Investigation may be directed, for example, toward identifying connective tissue disorders or other autoimmune illnesses, celiac disease, heavy metal toxicity, malignancy, or infectious diseases such as Lyme or hepatitis. Copper deficiency could be considered, although typical features of myeloneuropathy are not evident.

DNA testing, which is both highly sensitive and specific, should be pursued if a genetic origin is suspected from the presentation, family history, or nerve conduction study. The clinical presentation of hereditary neuropathies is highly variable: family members with a common mutation may manifest very differently, while mutations in distinct genes can cause similar-appearing phenotypes. Detailed investigation of family history and evaluation of relatives can contribute significantly to diagnosis of previously-unclassified neuropathies (Dyck et al, 1981). Of course, assessment is further complicated since some 30% of patients with genetic neuropathies have sporadic mutations.

Because genetic testing is expensive, a directed approach is recommended based on the inheritance pattern and the finding of demyelinating versus axonal polyneuropathy on nerve conduction testing (England et al). For demyelinating polyneuropathies, the most common inherited and sporadic form is autosomal dominant and is caused by duplication of the PMP22 gene; an X-linked form may be caused by mutation of GJB1. Axonal neuropathy, when auto-

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Expert Opinion #2

Jeremy D. Slater, MD
Director, Texas Comprehensive Epilepsy Program University of Texas - Houston Medical School

Question: With the increasing availability of generic versions of the newer anticonvulsant medications, can patients who are initiated on these drugs or are already taking a brand name version of them be effectively treated with the generics?

Despite the plethora of potential contributors to the cost of care, perhaps the single greatest affecting patient compliance with therapeutic recommendations and the control of seizures is the cost of prescription medication. In the year 2000, $141 billion was the total cost of prescription drugs in the United States. Generics accounted for 42% of the total number of prescriptions, but only 8% of the total cost. Estimates of the potential savings from generic drug substitution vary from $1.16 to $1.32 billion for each 1% increase in the use of generics.

The cost benefit is obvious, but against this must be weighed a number of cons, included the potential for recurrent seizures, the variability of individual patient responses to antiepileptic drugs with low therapeutic indices, the issue of bioequivalence versus therapeutic equivalence, the inability to ensure continuing refills for the same manufacturer and the impact of all of these issues on adherence.

In 2006, the American Academy of Neurology updated its recommendations for generic substitution of antiepileptic drugs, stating that the Academy "opposes generic substitution of anticonvulsant drugs for the treatment of epilepsy without the attending physician's approval", noting that "the Food and Drug Administration (FDA) has allowed for significant differences between name-brand and generic drugs". The AAN noted that for anticonvulsants small variations in concentrations between name-brands and their generic equivalents can cause toxic effects and/or seizures. Unlike other diseases, a single breakthrough seizure may have devastating consequences, including loss of one's driver's license, injury or even death. As a result, the position paper opposed all state or federal legislation that would impede the ability of physicians to determine which anticonvulsants to prescribe for epilepsy, as well as policies that would result in the arbitrary switching among anticonvulsants, including generic substitution of anticonvulsants for epilepsy at the point of sale without prior consent of the physician and the patient. The distinction of anticonvulsant use for the treatment of epilepsy from the use of the drugs for other disorders was recommended.

Despite the widespread view that generic substitution of anticonvulsants carries risks of toxicity and/or loss of seizure control, supportive evidence is primarily anecdotal. Controlled pharmacokinetic studies do not uniformly support this.

At the heart of generic substitution are the FDA accepted parameters for what constitutes bioequivalence. A single dose of reference drug and test drug are given to healthy adults in a crossover design. Bioequivalence is accepted when the 90% confidence intervals of the ratios of the area under the curve (AUC), peak concentration (Cmax) and time to peak concentration (Tmax) fall between 0.8 and 1.25. This is frequently misunderstood to mean there can be a 20-25% difference between the mean of the two products. If in fact the ratios are close to 80% or 125%, it is more likely the upper or lower confidence limit will fall outside the accepted range. Table 1 highlights a study evaluating bioequivalence in highly variable drugs. The AUC and Cmax for the brand product vary by about 60%. The means and standard devotions for both measures between brand and generic are fairly close. But when one examines the 90% confidence interval, the drugs do not meet the requirements for bioequivalence.

This system works reasonably for defining any single bioequivalent generic for a brand name product. The systemic flaw is the eventual existence of multiple generic providers for the same compound. The question is not simply one of generic substitution for brand name, but the effect of switching from one generic formulation to another. The FDA has approved a replicate design – two trials of the name drug and then two trials of the generic drug to account for variance. The difficulty is that this method rewards manufacturers of drugs with low variability and penalizes those who have drugs with high variability. The confidence limits may be scaled if the reference product demonstrates more variability

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Expert Opinion #2

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somal dominant, is most likely due to mutation of MFN2. Here too, mutation of GJB1 can result in an X-linked axonal form.

The patient in our case had preserved ankle jerks, which may seem unusual in peripheral neuropathy. Wolfe et al (1999) noted, however, that in patients with polyneuropathy of unknown etiology, deep tendon reflexes were present at the ankles in half of the cases. For the great majority of patients in that study, symptoms began in the lower extremities, as with our patient. Progression occurred slowly over years, with spread to the hands in 42% of patients. In diabetic peripheral neuropathy, hand symptoms typically are seen after sensory loss has ascended to the level of the knees (Said, 2007).

In about 25% of neuropathy patients, all laboratory testing is normal despite clear clinical and electrodiagnostic indications of neuropathy. These patients are classified as having cryptogenic or idiopathic neuropathy. While that outcome is frustrating to patients and clinicians alike, the extent of progression tends to be slow, and virtually all such patients remain ambulatory (Wolfe et al, 1999). Cryptogenic polyneuropathy is an active area of research in our neuromuscular clinic at UT Southwestern Medical Center.

References:
Dyck PJ, Oviatt KF, and Lambert EH. Intensive evaluation of referred unclassified neuropathies yields improved diagnosis. Ann Neurol. 1981;10:222-226.

England JD, Gronseth GS, Franklin G, et al. Practice Parameter: Evaluation of distal symmetric polyneuropathy: Role of laboratory and genetic testing (an evidence-based review). Report of the American Academy of Neurology, American Association of Neuromuscular and Electrodiagnostic Medicine, and American Academy of Physical Medicine and Rehabilitation. Neurology. 2009;72:185-192.
Said G. Diabetic neuropathy--a review. Nat Clin Pract Neurol. 2007;3:331-340.
Smith AG and Singleton JR. The diagnostic yield of a standardized approach to idiopathic sensory-predominant neuropathy. Arch Intern Med. 2004;164:1021-1025.

Wolfe GI, Baker NS, Amato AA, et al. Chronic cryptogenic sensory polyneuropathy: clinical and laboratory characteristics. Arch Neurol. 1999;56:540-547.

Expert Opinion #2

(continued from page 7)

than the test product. This allows for wider confidence limits if the reference demonstrates erratic absorption.

The current FDA approval system has multiple resulting weaknesses. It does not allow for individual intra-patient variability, or what is also called subject-by-formulation. Generic manufacturers may engage in "lot shopping" – doing dissolution testing on multiple lots of a reference drug until one is found closest to the test product. Unlike an NDA, there is no requirement that all data be submitted to the FDA, only that confirming bioequivalence. There is also no requirement that any product be restudied in vivo once approved.

The use of lower-priced generic products is an intrinsic part of healthcare and in many instances may represent the most cost-effective option, but the benefit of lowered cost must be measured against the potential risk of adverse effects and lost seizure control. Given the potential consequences, increased vigilance (e.g. serum drug monitoring, seizure diary) would seem prudent when switching between drug products. Patients and pharmacies should be discouraged from frequent generic switching. Good communication between the physician, pharmacist, and patient is essential. The FDA has an established committee to look at generic products, and they use MedWatch data as their primary source. Reporting problems with switching to MedWatch may increase the awareness regarding problems in the switching of antiepileptic drugs.

Table 1 – Bioequivalence of highly variable drugs

	AUC (n=36)	Cmax (n=36)
Brand Product (CV%)	212±129 (60%)	79±48 (60%)
Generic Product (CV%)	224±146 (65%)	80±62 (77%)
Ratio of means (generic/reference)	1.05	1.01
90% CI	0.72-1.07	0.87-1.21

Council on Scientific Affairs Report 6 at the 2002 AMA Annual Meeting.
National Association of Pharmaceutical Manufacturers, December 15, 2000.
Crawford P, Feely M, Guberman A, Kramer G. Are there potential problems with generic substitution of antiepileptic drugs? A review of issues. Seizure 2006;15(3): 165-176.
Feely M, Crawford P, Kramer G, Guberman A. Risk management in epilepsy: generic substitution and continuity of supply. The European Journal of Hospital Pharmacy Science 2005;11(4): 83–87,
http://www.aan.com/globals/axon/assets/2323.pdf - accessed 1/19/2009.
Meyer MC. United States Food and Drug Administration requirements for approval of generic drug products. J Clin Psychiatry 2001;62(suppl 5):4-9.
Benet LZ, Goyan JE. Understanding bioequivalence testing. Transplantation Proceedings 1999;31(3): 7S-9S.
Meyer M, Chan K, Bolton S. Generic warfarin: implications for patient care–another view. Pharmacotherapy. 1998;18:884-886.
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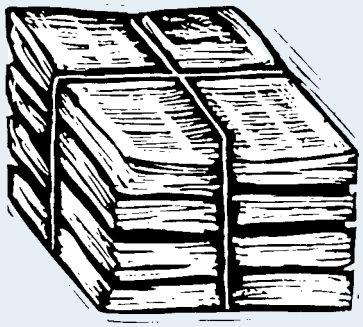


Broca's Area Call for Newsletter Items

Who:
Texas Neurological Society members

What:
Submissions for Spring 2009 issue of *Broca's Area.* Tell us about your awards, recent appointments, etc.

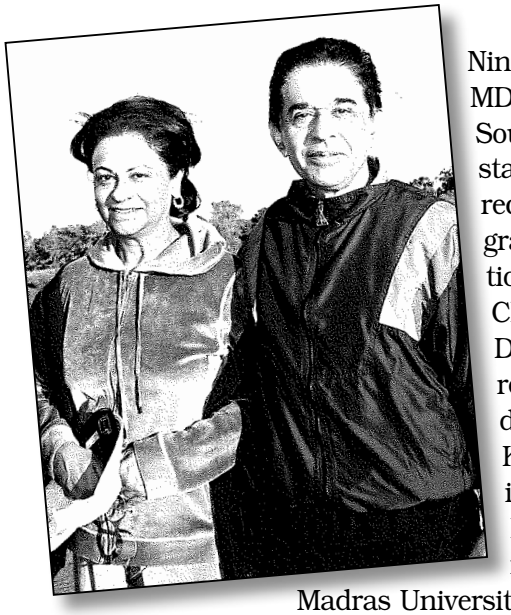
Where:
Send to:
Rachael.Reed@texmed.org

When:
by April 1

Why:
To get involved with your society and communicate with your colleagues across the state.

BROCA'S BIOS

Ninan Mathew, MD



Ninan T. Mathew, MD was born in the Southern Indian state of Kerala and received his undergraduate education at the Madras Christian College. Dr. Mathew received his MD degree from Kerala University in India and his D.M. degree in neurology from Madras University after he got his training in neurology at the Christian Medical College, Vellore. He was named fellow of the Royal College of Physicians and Surgeons of Canada in 1971.

Dr. Mathew was the chief resident in the department of neurology at Methodist Hospital and Baylor College of Medicine in Houston, Texas. After residency, Dr. Mathew was appointed as assistant professor in the department of neurology at Baylor College of Medicine and associate director of the Baylor Methodist Center for Cerebral Vascular Research. Later, he became the director of the Human Cerebral Blood Flow Laboratory at the center. He developed his interest in migraine while doing studies in cerebral blood flow in patients with migraine at that time. He was a clinical professor in the division of restorative neurology at Baylor College of Medicine.

In 1976, he established the Houston Headache Clinic, which has grown into a nationally known comprehensive headache treatment and research center.

Dr. Mathew is a former president of The International Headache Society, American Headache Society and The American Council for Headache Education.

Dr. Mathew has been active in the American Academy of Neurology (AAN), has directed breakfast seminars, dinner seminars and full-day headache courses for a number of years at the annual meetings. He helped to establish the Headache and Facial Pain Section of The American Academy of Neurology and served as its chairman.

Dr. Mathew has published more than 200 peer-reviewed articles and his main research interest is chronic headaches, pharmacotherapy of headaches, and cluster headaches. He edited two volumes of "Neurologic Clinics" and one of "Medical Clinics" and a monograph on cluster headache and has co-authored two editions of Handbook of Headache with Dr. Randolph Evans. Dr. Mathew has contributed several chapters to major textbooks in headache and neurology including the "Handbook of Neurology" series.

Dr. Mathew was a member of the editorial board of "Cephalalgia" and "Headache" for a number of years and is now a regular reviewer for "Neurology," "Lancet," "Cephalalgia," "Headache," and "Annals of Internal Medicine." He is an invited speaker to several national and international meetings related to headache.

Who was your most influential teacher and why?

I would consider Dr. John Graham of Boston, Massachusetts, as the most influential teacher I had in the field of headache. His approach to taking a thorough history, looking at the patient as a person, inquiring about the details of his lifestyle and his emotional aspects, taught me a great deal. Dr. Graham was a "complete physician" in my assessment and in the early years, his teachings and writings influenced me a great deal.

Why did you become a neurologist?

When I was a medical student, I was convinced that neurology was the most logical clinical subject and had fun in learning it. The neuroanatomy, neurophysiology and the clinical neurological examination fascinated me as a medical student and eventually lead me to specialize in neurology.

Why did you decide to specialize in headache?

My special interest in headache started when I was doing cerebral blood flow studies at the Baylor-

BROCA'S BIOS

Methodist Stroke Center. I was in charge of those studies and we were measuring cerebral blood flow using radioisotope techniques in the patients with migraine. For the first time, I started seeing a large number of migraine patients who were not adequately cared for by any physician. They were misdiagnosed, mistreated, poorly treated or under treated, which lead to chronicity of their headaches. After seeing a large number of patients, I realized that this is an area of neurology, which deserves attention and interest and that lead me to take up headache as my specialty.

If you had not become a physician, what might you have become?

I probably would have become a professor in a college.

What has been the greatest achievement of your career?

I was fortunate to collect a large number of patients with chronic daily headache, who in fact transformed from episodic migraine to chronic migraine. We used the terms "chronic daily headache" and "transformed migraine" to describe those patients for the first time in the early 80's. That clinical entity was soon recognized by many others and has now become an established and recognized clinical entity as a chronic migraine. Analgesic overuse and psychiatric comorbidities were pointed out to be major risk factors for developing chronic migraine in our original papers. I consider that as my most important contribution to headache medicine.

I was also fortunate enough to lead the American Headache Society and the International Headache Society as a president of those organizations.

What you do for fun and what are your hobbies?

My hobby is gardening. With my wife's interest in Japanese flower arrangement, (IKEBANA) of which she is a teacher, I help her grow certain special plants in our yard.

Currently what field of science or medicine is most neglected?

The most neglected area of medicine I think is the lack of access to comprehensive care in chronic disorders like headache. Coverage for behavioral therapy, counseling, and non pharmacological modalities are nil or at least meager, while these chronic patients need those modalities very badly.

What is the best professional advice you have received and from whom?

The best professional advice I received was from Dr. John S. Meyer, former chairman of the Department of Neurology at Baylor College of Medicine. He told me that research is fun, research opens up your horizon and you get to publish, get to know more people in the field, get to go to meetings, and overall have a productive and enjoyable professional life. I think over the years research in conjunction with my clinical activity has helped me.

Tell us about your family?

My wife, Sushila, and I have three children. Our daughter, the eldest, a publicist, is married to an attorney. They have three children and live fairly close to us in Houston. My older son, a psychiatrist and associate professor of psychiatry at Mount Sinai Medical Center in New York, just got married. My younger son, a director (plays and cinema) by training, works for the National Endowment for the Arts. His job is to select new plays and recommend them for production by various theaters in the country. He is married with one child and lives in Washington D.C.

What are your favorite places that you like to visit on your travels?

Italy and Turkey are my most favorite countries. I particularly like the Amalfi Coast of Italy and would like to go back there as frequently as I can. Various places in Turkey including Istanbul, Ephesus and Cappadocia are my favorite areas and would like to visit them over and over again.

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