Surgery remains underutilized in patients suffering from epilepsy

by R. Mark Richardson, MD

Epilepsy is the most common serious brain disorder in the world. It affects all ages, ethnicities and socioeconomic classes. Patients and their families suffer an enormous physical, psychological, and social burden that is often related to misunderstanding, fear, and stigma. Likewise, the surgical treatment of epilepsy also suffers from a misunderstanding of its application, safety and potential benefit.

It has been a decade since a landmark randomized controlled trial published in the New England Journal of Medicine demonstrated the superiority of surgery for drug-resistant temporal lobe epilepsy over the continuation of medical treatment alone. At that time, it was estimated that although approximately 200,000 patients in the U.S. with temporal lobe epilepsy could benefit from surgery, only 1,500 surgeries were performed each year. Since then, the preponderance of evidence has continued to support the Class I data published in 2001: freedom from significant seizures occurs in approximately 60% of drug-resistant epilepsy alone. More remarkable than these results is the fact that as large a percentage of epilepsy surgical candidates remain untreated today as they did ten years ago.

A recent review of data from a national hospital database showed no significant change in the percentage of temporal lobe epilepsy patients receiving temporal lobectomy over time, between 2001 and 2008, despite an increase in the number of hospital admissions for this disease. While up to 15% of patients with epilepsy may benefit from a diagnostic or therapeutic surgical intervention, patients continue to be referred for surgical treatment an average of two decades after onset of seizures, which is much too late to avoid many irreversible disabilities. In fact, greater and more permanent benefits are obtained the earlier surgery occurs in the disease course. The underutilization of surgical treatment is alarming, especially given that seizure surgery is safe: significant morbidity following surgery occurs in only 1-2% of patients, while most patients experience improvement in their quality of life and overall IQ scores. Furthermore, advanced diagnostic and operative techniques continue to improve the safety and efficacy profiles for the surgical treatment of epilepsy.

The philosophy of the Adult Surgical Epilepsy Program is that temporal lobe epilepsy should be viewed as a surgically remediable form of epilepsy from the outset. Through the application of the most advanced imaging techniques, such as PET, MEG and ictal-SPECT, we are able to increase the chances of correctly identifying not only temporal lobe seizure foci, but extra-temporal sites as well. Functional imaging studies such as functional MRI and Magnetic Source Imaging provide preoperative brain mapping data that is useful in surgical planning. The gold standard for the preservation of important brain function—intraoperative mapping in patients who are awake during a portion of the surgery—is performed whenever indicated. This expertise in awake brain surgery allows us to take an aggressive stance toward epileptic foci located in eloquent brain areas, including language cortex. In the same way, tumors and other lesions that cause seizures can be resected even if they border the motor cortex and subcortical motor pathways. This is important because there is a direct correlation between the amount of tumor resected and the cessation of seizure activity.

The underutilization of epilepsy surgery indicates the high complexity of epilepsy treatment in general. The Adult Surgical Epilepsy Program takes a comprehensive, multidisciplinary approach to tackling this problem. The major processes involved in undertaking epilepsy surgery are: (1) a comprehensive presurgical evaluation; (2) determination of surgical candidacy including the timing of surgery; (3) selection of the most appropriate surgical method and approach; (4) preparation for the provision of postsurgical treatment, including rehabilitation and (5) comprehensive evaluation of outcome. The goal of epilepsy surgery is to improve a patient’s quality of life by maximizing seizure relief and minimizing adverse effects. At UPMC, adult epilepsy patients that are surgical candidates receive the full spectrum of diagnostic and surgical options. Educating patients and the community about the potential benefits of epilepsy surgery is at the core of our mission. The patient relationship and concurrent management of comorbidities, such as depression, is paramount.

In addition, we are committed to furthering scientific knowledge regarding epilepsy and related brain functions. In fact, the patient-physician relationship is furthered in the Adult Epilepsy Surgery Program by unique opportunities for patients to contribute to brain research.

(continued on page 6)
CHAIRMAN’S MESSAGE

One year in Pittsburgh

Upon completion of my first year in Pittsburgh I wish to reflect on a number of important events. I knew when I accepted this position that I was inheriting an extremely remarkable and accomplished department. I can now say that after being here one year that the excellence of this department exceeded any expectations I had. The commitment to excellence and innovation is truly second to none in the world of neurosurgery. A couple of points from the past year are worth reflecting upon and making special note.

1) We remain the largest and most clinically productive department of neurosurgery in the county.

2) Two independent studies published recently in the Journal of Neurosurgery placed our department at the top of academic neurosurgery. The first study, “Academic impact and rankings of American and Canadian neurosurgical departments as assessed using the h index,” ranked the academic impact of neurosurgery departments over the past decade. This was an objective assessment based upon an accepted measure of the impact of publications. The University of Pittsburgh ranked number one. The second study, “Medical school and residency influence on choice of an academic career and academic productivity among neurosurgery faculty in the United States,” ranked our program first in terms of graduates remaining in and contributing to academic neurosurgery.

Both of these positive rankings are an honor as well as a challenge. We must not only continue to do what this department has done to distinguish itself, but given our leadership in these rankings, we must now aim to continue the tradition of academic excellence and to do what we do best: excel in clinical care, excel in residency training, and continue a tradition of innovation. We need to continue to reinvent ourselves and be visionaries.

I also wish farewell and best of luck to three remarkable residents who have completed their training: Drs. Dean Kostov, Hilal Kanaan, and Richard Singleton.

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Robert M. Friedlander, MD, MA
Chairman, Department of Neurological Surgery
UPMC Endowed Professor of Neurosurgery & Neurobiology
University of Pittsburgh School of Medicine
University of Pittsburgh Medical Center

2011 graduating chief residents (left to right) Richard Singleton, MD, PhD, Hilal Kanaan, MD, and Dean Kostov, MD, with department chairman Robert M. Friedlander, MD, (second from right)
A closer look at presurgical evaluation of patients with epilepsy

by Anto Bagic, MD

While epilepsy fascinated humanity for millennia, it appears that over the last 4000 years—as a society and profession—we had only managed to replace ignorance with some knowledge while superstition and stigma towards persons with epilepsy (PWE) unfortunately persisted. Regrettably, having four times more antiepileptic drugs (AEDs) did not change the fact that one third of all treated epilepsy patients continue to seize in spite of our best efforts. Furthermore, best estimates suggest that in spite of Class I evidence and proactive clinical practice guidelines we offer the only potential cure—epilepsy surgery—to only one in 30 patients who could greatly benefit from it. There is no comprehensive research to explain this phenomenon, but an informed practitioner could suspect several elements: some physicians’ reservations about brain surgery, some physicians’ low level of comfort with referring for surgery, public fears regarding brain surgery, widespread misconceptions about surgical interventions, etc. Presumably a mixture of these factors is in the background of difficulties that the ROSE trial (www.epilepsysurgery-rosetrial.com/(412) 683-7279) has had in recruiting patients with mesial temporal lobe epilepsy with hippocampal sclerosis (MTLE-HS). This randomized controlled trial is aimed at comparing classical surgery and radiosurgery as treatments for this surgically remediable epilepsy syndrome.

In spite of sustained efforts of the ILAE on defining medically refractory epilepsy as “failure of adequate trials of two tolerated and appropriately chosen and used AED schedules (whether as monotherapies or in combination) to achieve sustained seizure freedom,” it is still not rare to have a patient referred for a specialty evaluation to the Comprehensive Epilepsy Center on three AEDs none of which is titrated sufficiently. While it was established over five years ago that a failure of two AEDs leaves only a 2% chance that trying the next four would control seizures, even many epileptologists continue to cycle through all AEDs available before referring PWEs for further evaluation and thus directly contribute to an almost 20-year-long delay in referring for non-pharmacologic treatments of PWEs including potentially curative surgery.

Currently, upon experiencing their initial seizures, patients invariably have an EEG and brain MRI with epilepsy protocol. Usually, nothing else is necessary for an adequate pharmacologic treatment of adult patients at diagnosis. Persons failing two AEDs given long enough at appropriately titrated doses should be referred to an epilepsy center for an evaluation for intractable epilepsy. Here (figure 1) the patient may need to complete an EEG and MRI evaluation if they are inadequate for any reason or uninformative and be referred for electro-clinical correlation of their spells using a V-EEG (video-EEG) in the Epilepsy Monitoring Unit (EMU), where their medications are tapered or weaned (as appropriate and necessary) in order to increase the monitoring yield by documenting enough habitual events of interest. It is inappropriate and not medically indicated to refer a patient for any other neurological studies for their suspected epileptic spells before they undergo a complete V-EEG and their events are confirmed to be epileptic. While in the EMU, the patients also have neuropsychological testing that is not only a cross section of their cognitive performance but also has a role in helping seizure localization; a pre-WADA procedure may be performed in patients who are having their epileptic focus in dominant hemisphere. For patients with remaining ambiguities in localizing the epileptic focus, a SPECT injection may have to be performed. Once a sufficient number of habitual events of interest is documented (this may mean more than five events for those with bilateral seizure onset or multiple types of events) the patient may be referred for additional non-invasive studies to assist seizure localization in ambiguous cases: a PET study and magnetoencephalography (MEG) to provide non-redundant localizing information that are not supplied by non-invasive EEG-based studies.

The value of MEG (figure 2) in selected cases has been established and supported by ample literature. A MEG is the most powerful method for studying brain function directly non-invasively based on the magnetic fields generated by the neural currents underlying normal and pathological brain functions as reflected outside the skull. UPMC is among 20 selected premier institutions in the country that have had the most advanced MEG-EEG system in operation for more than five years. By appropriately combining expertise and comprehensively interpreted MEG-EEG with traditional methods of presurgical evaluation (EEG, V-EEG, MRI, SPECT, PET, and WADA), the University of Pittsburgh Comprehensive Epilepsy Center’s teams (adult housed in the UPMC Presbyterian and pediatric stationed in Children’s Hospital of Pittsburgh of UPMC) succeed in deeming many traditional “non-surgical candidates” seizure-free.
Invasive EEG evaluations provide critical data for patient management

by Mandeep S. Tamber, MD, PhD

The success of any planned resective surgery depends critically on our ability to localize the epileptogenic zone, that is, the area of the brain necessary and sufficient for seizure initiation, and whose removal/disconnection is necessary to stop seizures.

With modern advances in structural (high field MRI) and functional/metabolic imaging (PET and ictal-interictal SPECT), and the routine use of scalp video-EEG to record actual ictal-EEG data, the indications for invasive monitoring have become more refined. Within the realm of pediatric epilepsy surgery, however, numerous scenarios arise where chronic invasive intracranial EEG recordings using subdural and/or depth electrodes provide data that is essential for optimal patient management.

A comprehensive non-invasive pre-surgical workup (which includes a thorough description of seizure semiology; ictal and interictal video-EEG data; MRI, PET and/or SPECT imaging; and neuropsychological testing) can eliminate the requirement for invasive EEG recordings in many epilepsy surgery patients, provided that all the data are concordant in their lateralization and localization. That being said, one or more of the pre-surgical localizing studies may yield information that is discordant with the others. Moreover, less invasive studies may fail to lateralize or localize the epileptogenic focus entirely. In neocortical epilepsy, for instance, scalp EEG is localizing only in approximately 50% of cases, and may falsely localize the site of onset in 5-10% of patients. In these circumstances, if there still exists a reasonable hypothesis regarding the localization of the presumed epileptogenic focus, even when considering the non-diagnostic or discordant piece(s) of information, a period of invasive EEG recordings is often successful in determining seizure onset.

In pediatric epilepsy surgery, neuroimaging may be normal despite clinical evidence of localization-related epilepsy. Since there is no “lesion” to guide the resection, data from invasive EEG recordings proves invaluable for directing a resection. Even in those circumstances where scalp-EEG accurately identifies a seizure focus that has a concordant imaging abnormality, invasive monitoring may still be indicated. The most common examples of the latter are those in which seizures are associated with multifocal damage to the brain, or in which the epileptogenic zone is thought to be larger than the structural or metabolic abnormality seen on imaging (e.g. common pediatric epilepsy substrates such as malformations of cortical development, tuberous sclerosis, head trauma, and meningoencephalitis).

Finally, invasive monitoring is critically important in those cases where the ictal pattern or lesion is close to eloquent cortex. Although our ability to noninvasively identify functional areas of cortex using functional MRI or functional MEG is improving, cortical mapping using implanted subdural electrodes is still considered the gold standard technique for precisely mapping the relationship between the epileptogenic zone and functional areas of the brain.

From a diagnostic perspective, the advantages of invasive EEG recordings over scalp-EEG lie in the improved spatial resolution and sensitivity of electrodes placed directly on the surface of (or within) the brain. It has been estimated that an interictal spike needs to activate 6cm² of contiguous cortex to be detected by a scalp electrode. The same epileptoform discharge recorded with intracranial electrodes will be approximately an order of magnitude larger in amplitude compared to scalp-EEG. An additional advantage of intracranial recordings is the ability to sample areas of the brain that are not well evaluated by scalp-EEG. Surgical placement of subdural electrodes along the orbitofrontal lobes or in the interhemispheric corridor, or placement of depth electrodes into the hippocampus or other deep lesions, often provides information that is vital to designing an appropriate surgical resection.

The procedure to obtain invasive EEG recordings poses the risk of infection, hemorrhage and cerebral edema. In addition, the child’s hospital stay is lengthened by the time it takes to obtain the ictal onset and functional mapping information that is required to plan a definitive resective procedure (usually 5-7 days). Although surgically placed EEG electrodes offer improved sensitivity compared to scalp-EEG, this comes at the cost of limited brain coverage. This property highlights the critical importance of a multi-disciplinary pre-operative epilepsy surgery case conference where all of the non-invasive information is reviewed and a hypothesis regarding the area of the brain that is responsible for generating seizures is formulated, so that the invasive electrodes are placed in the optimal location for recording seizure onset, not just seizure spread.

Invasive EEG recording is neither something to be avoided nor used indiscriminately. The decision to use this important tool is based on a through assessment of all available non-invasive information as to the postulated area of seizure onset, the perceived benefit of intracranial EEG recordings, as well as an assessment of surgical risk.
Vagal nerve stimulation approved, common procedure for complex epilepsy

by Douglas Kondziolka, MD

Vagal nerve stimulation (VNS) is an approved and common procedure for medically refractory complex epilepsy. Although the precise mechanism of the response is still unknown, there are a number of observations that justified its initial use for epilepsy and its continuing strong role for many patients. The importance of the vagus nerve and its potential effect on the electroencephalogram (EEG) extends back to the 1930s. In the 1980s, it was demonstrated that VNS could attenuate motor seizures in animals induced by strychnine as well as tremors, and that the potential beneficial effects on seizure suppression lasted longer than the acute stimulation.

Human VNS implants began over 20 years ago. In the vast majority of patients, the device is implanted on the left vagus nerve. From a cardiac perspective, the right side innervates the sinoatrial node and the left innervates the atrioventricular node with less influence over heart rate. A right-sided VNS implant can be placed if access to the left nerve is compromised in some way, but this is uncommon.

Based on extensive research, VNS is used for partial complex epilepsy, generalized epilepsy, and has been evaluated in major depression. It has been shown that the acute effect of VNS can be used to terminate a seizure, and the chronic effect of VNS can inhibit seizure activity and thus decrease the likelihood that new seizures will occur. A “VNS responder” has been defined as patients who report 50% or greater reduction in seizure frequency, and indeed the vast majority of our patients achieve such benefit. Almost all request that their pulse generators are replaced when they near the end of service, typically lasting six to nine years.

There are a number of theories to the mechanism of VNS, but many believe that it exerts its effect by direct afferent action rather than indirect afferent projections. The anatomy of this remains poorly understood, although there is evidence to support that norepinephrine released from the amygdala may be important related to projections from the nucleus of the solitary tract.

The locus coeruleus may similarly have a key modulating role. Indeed, direct electrical stimulation of the locus coeruleus reduces kindling produced by amygdala stimulation.

Patients with medically refractory epilepsy that is multifocal in origin and not amenable to other forms of surgery can be considered for vagus nerve stimulation. Working together with the patient’s neurologist who will subsequently program the device, the patient and family/caregivers are instructed about the surgical technique, postoperative care, risks, and outcomes. The procedure is performed under general anesthesia and typically takes one to two hours to complete. The majority of patients are discharged from the hospital the same day. Two small wounds are made - one in a transverse neck crease and the second below the clavicle and closed with subcuticular sutures. The current model of the pulse generator is much smaller than earlier models and is barely seen in most patients. The newer AspireHC model combines the circuitry of the Demipulse model generator with a higher capacity battery, which can offer extended performance for patients at higher stimulation settings.

The vagus nerve is exposed within the carotid sheath, and positive and negative electrode coils are gently placed around the nerve together with an anchoring coil to stabilize the position of the electrode against neck movement. The risks of infection, pain, or device malfunction are low. In my own experience, I have not seen any problems with hemodynamic effects of vagus nerve stimulation. One young patient developed a hoarse voice approximately five days after surgery during strenuous activity, but this resolved over several months.

Implantation of pulse generators for the care of patients with epilepsy, movement and behavioral disorders, pain, and cardiac dysrhythmias has become increasingly common. VNS is one of the most important surgical options for patients with complex epilepsy that can provide a great deal of benefit to both patients and caregivers.

Courtesy Cyberonics, Inc.
Epilepsy monitoring unit observations yield key clinical, research benefits

by Elizabeth Tyler-Kabara, MD, PhD

Since January 2009 greater than 90% of the patients age eight-years-old and older admitted for monitoring with subdural strip and grid electrodes have been enrolled in a clinical study to explore the use of electrocorticography (ECoG) in brain computer interfaces. This has provided the preliminary data for two clinical trials for the use of brain computer interfaces as neural prosthetics in patients with spinal cord injuries. Additionally, observations made during recordings done in the EMU have led to a study about optimization of electrode spacing.

Electrocorticography has proved to be a valuable technique for the localization of epileptic foci. It is used both intraoperatively and in the EMU. Many researchers have attempted to improve the sensitivity of ECoG recordings by redesigning electrodes with tighter electrode spacing and reduced electrode size in expectation of improved resolution. We began designing electrodes to optimize the ability to identify as many unique features of the ECoG signals for use with a brain computer interface. In the literature we found that in some circumstances, the depth of the neural sources, or neurons, were often neglected, leading to unintended consequences of these changes. We have focused on estimating the trade-offs implicit in electrode size and spacing in order to provide a design with improved resolution at useful signal-to-noise ratios.

We used a model of the brain and real data to estimate the spatial resolution of various electrode designs and to evaluate the signal to noise ratio. An analytic model of the volume conductor was created and solved using electromagnetic reciprocity for the sensitivity of a subdural disc electrode to each point in the cortical volume. ECoG recordings from 10 human subjects undergoing monitoring for intractable epilepsy were used to identify realistic electrode impedance, and signal-to-noise levels.

Electrode disc radius was found to affect not only the effective resolution of the recording, but also the depth of sensitivity in cortex. Thus, very small electrodes are unable to record from all but the shallowest synapses of Layer I, while very large electrodes show relatively minor loss of sensitivity even well past the neocortex. In order to maintain sensitivity of at least 50% through to Layer 5, an electrode with a radius of at least 1.8mm was required. At this electrode radius, the expected resolution of a grid is between 3mm and 5mm depending on depth, suggesting one possible interelectrode spacing. This suggests traditional clinical grids, which typically have an interelectrode distance of 1 cm and a radius of 2.5 mm, undersample the cortical surface by 2-3 times. In contrast, an electrode with radius 0.5mm is able to achieve a resolution of 1-4mm depending on depth, but has only 26% sensitivity to layer 5 compared to layer 1.

This model suggests theoretical and practical limits to the resolution of ECoG recordings (both over the cortical surface and in depth), and important parameters to consider to achieve useful recordings. Precise identification of the volume of sensitivity of an electrode may allow researchers and clinicians to better analyze ECoG signals and to provide an improved understanding of the underlying neurobiology and pathology of these complex waves. This suggests that specific grid configurations could be designed to optimize recordings from cortex versus deeper lesions. This could be used to better locate seizure foci.

These studies represent collaboration between the Departments of Neurological Surgery, Physical Medicine and Rehabilitation, and Neurology.

Surgery remains underutilized in patients suffering from epilepsy

(continued from front page)

Historically, since the work of Penfield in the 1930’s, patients with epilepsy who undergo neurosurgical procedures have arguably contributed more to neuroscience research than any other group. Because an entire armamentarium of diagnostic tools is focused on identifying the causes and effects of seizure activity, a very privileged access for studying brain function exists. This tradition continues at UPMC, where data collected from patients undergoing intracranial electrical recording of brain activity has been applied previously to the development of brain machine interfaces for patients paralyzed by other brain injuries. An additional new research focus in the program will give patients the opportunity to help elucidate neurobiological processes of epilepsy itself that may eventually become therapeutic targets.

Assessing Candidacy for Epilepsy Surgery

- Any individual who continues to have seizures after two first line anti-seizure medications have been administered sequentially should be referred for a surgical evaluation.

- The above rule should be applied to all individuals with epilepsy, whether from a semiological perspective seizures appear to be either focal or generalized.

- Medication trials may take anywhere from three months to two years, after which continued seizures are not a “necessary evil” and should not be tolerated.

- Focal seizures, especially those of the complex partial variety, are more likely to be resistant to medical management than are generalized seizures.

- Patients with complex partial seizures and evidence of a temporal lobe structural lesion or mesial temporal sclerosis are likely to fail medical management.

For more information on the University of Pittsburgh Department of Neurological Surgery epilepsy treatment program, please call (412) 647-3685.
Residency Program Ranks as Most Productive Program in Recent Journal of Neurosurgery Paper

The Department of Neurological Surgery residency program was ranked as the most productive residency program in the nation in terms of graduates remaining and contributing in academic neurosurgery according to a study published recently in the Journal of Neurosurgery.

The study’s authors sought to determine those programs that produce a high number of graduates remaining within academic programs and the contribution of these graduates to academic neurosurgery.

In the study, 97 academic neurosurgery departments with 986 faculty members were analyzed. All data regarding training program and medical school education were compiled and analyzed by center from which each faculty member graduated. The neurosurgery training program at the University of Pittsburgh produced the highest number of academic neurosurgeons in this sample.

Richardson, Ferrante Join Department

The University of Pittsburgh Department of Neurological Surgery would like to welcome R. Mark Richardson, MD, PhD, and Robert J. Ferrante, PhD, to the faculty as of July 2011.

A specialist in comprehensive epilepsy surgery and deep brain stimulation, Dr. Richardson will serve as director of the department’s adult epilepsy surgery program, co-director of functional neurosurgery and director of the Translational Neurobiolology Laboratory.

Dr. Richardson plans to develop a world-class adult surgical epilepsy program at UPMC by combining excellence in surgical and postoperative care with unique opportunities for patients to participate in brain research. Additionally, he will lead the development of an interventional-MRI-based deep brain stimulation implantation program at UPMC, one of the first of its kind.

Prior to joining the faculty at the University of Pittsburgh, Dr. Richardson completed a neurosurgical residency at the University of California, San Francisco. He received his undergraduate education at the University of Virginia and completed his medical and doctoral education in the MD/PhD program at the Medical College of Virginia where his interest in adult neurogenesis led to an NIH National Research Service Award.

A renown expert in Huntington’s Disease research, Dr. Ferrante will work closely with department chairman Robert M. Friedlander, MD, in his Neuroapoptosis Laboratory.

In 1985, Dr. Ferrante’s HD research described a characteristic pattern of ‘selective vulnerability’ in cell types, showing some sensitive to degeneration, while others virtually impervious to the disease. These findings formed the basis of a widely accepted clinical neuropathological grading scheme for the disease. He currently is researching biomarkers of neurodegenerative disease to assess disease progression or therapeutic efficacy in clinical trials.

Prior to coming to Pittsburgh, Dr. Ferrante served as professor of neurology, pathology, and psychiatry at Boston University and director of the Experimental Neuropathology/Translational Therapeutics Laboratory at Bedford Veterans Administration Medical Center in Bedford, MA. He received both his doctorate and bachelor degree from Boston University.

Eric Altschuler Leads PA Neurosurgeons Meeting

The Pennsylvania Neurosurgical Society held its annual meeting July 8-9 in Hershey, PA, under the direction of University of Pittsburgh clinical assistant professor Eric Altschuler, MD. Dr. Altschuler is in the middle of a two-year term as president of the organization.

In The Media

• Robert M. Friedlander, MD, was quoted in an Associated Press wire service article, May 19, commenting on congresswoman Gabrielle Giffords’ surgery to place a plastic implant to permanently cover and protect her brain.

• Joseph C. Maroon, MD, was featured in a June 2011 Allegheny County Medical Society Bulletin article detailing how physical fitness has played an important role in his career as a neurosurgeon.

Dr. Maroon was also quoted in a June 27 Pittsburgh Post-Gazette article on mixed martial arts, commenting on the sport’s need to institute parameters for concussion management.

Congratulations

• Dr. Maroon was selected to serve as an associate editor for Surgical Neurology International.

• Johnathan Engh, MD, was selected to serve on the editorial board of Neurosurgery.

New Research Funding

• “Cortical Control of a Dextrose Prosthetic Hand.” Funding Agency: National Institute of Health. Principal Investigator: Andrew Schwartz, MD; Co-Investigator: Elizabeth Tyler-Kabara, MD, PhD; $53,829.

• “Developing Micro RNA-based Therapies for Huntington’s Disease.” Funding Agency: CHDI. Principal Investigator: Robert M. Friedlander, MD; $175,282.

• “Outcomes in Patient Underlying Surgical Intervention for Chiari Type 1 Malformation with Syringomyelia.” Principal Investigator: Ian F. Pollack, MD.


Prominent Lectures and Appearances

• Dr. Maroon was a guest of honor of the neurology and neurosurgical societies of the Dominican Republic in Santo Domingo, April 17, providing two lectures at the Center for Cardio-Neuro-Ophthalmology and Transplant.

• Peter C. Gerszten, MD, was a visiting professor at the University of Barcelona Hospital on June 14.

Personal Congratulations

• Edward Shaffer, PA-C, and wife Gina, had a baby girl, Gianna Nicole, on April 15.

• Edward A. Monaco, III, MD, PhD, and wife Sara, had a baby boy, Nicholas Anthony, on June 27.

Welcome

• Phillip Lee, MD, PhD, David Panczykowski, MD, Gregory Weiner, MD, Georgios Zenonos, MD, PGY1 residents in the University of Pittsburgh neurosurgery residency program.
Pitt’s Center for Image-Guided Neurosurgery hosting international Gamma Knife meeting

The University of Pittsburgh Center for Image-Guided Neurosurgery will be hosting the first-ever “Gamma Knife Radiosurgery in the Americas,” September 17-19 at Pittsburgh’s historic Soldiers and Sailors Memorial Hall. The international meeting is designed to bring together neurosurgeons, radiation oncologists, medical physicists, and other radiosurgery professionals from North, South and Central America in order to share research and clinical data related to the use of the Leksell Gamma Knife—one of the world’s most advanced means available to manage brain tumors, arteriovenous malformations and pain or movement disorders.

The event is cosponsored by the University of Pittsburgh and the North American Gamma Knife Consortium (NAGKC), a group of academic and clinical centers of excellence from across the continent performing brain stereotactic radiosurgery using the Gamma Knife. NAGKC was recently formed to pool research and clinic information to help improve treatment outcomes. The Center for Image-Guided Neurosurgery—under the direction of L. Dade Lunsford, MD, and Douglas Kondziolka, MD—serves as coordinating center for the group. The center has performed over 10,000 Gamma Knife procedures since the installation of the first device in 1987 and has since become an international training center for radiosurgery professionals.

A wide range of topics will be presented and discussed by some of the most prominent names in the field during this three-day event. For more information, please visit the NAGKC website at www.nagkc.pitt.edu or contact the UPMC Center for Continuing Education at (412) 647-8232.