

UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE  
DEPARTMENTS OF NEUROLOGY AND NEUROSURGERY



# CLINICAL NEUROSCIENCES UPDATE

FALL 2017

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## Best-Kept Secret?

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UNIVERSITY of MARYLAND  
SCHOOL OF MEDICINE

## LETTER FROM THE CHAIR OF NEUROSURGERY



On behalf of us all in the Department of Neurosurgery, I first want to welcome **Peter Crino, MD**, as the new Chair of Neurology. There will be many important areas for enhanced collaborations particularly in our joint effort in the neuro-oncology, epilepsy, movement disorder and stroke.

The Department's clinical efforts and our residency training program remain very strong. We are now focusing on off-campus sites to expand our practice and further integrate with system hospitals to meet common goals.

Some of the highlights in our department with regard to research and discovery include progress that we have made in the application of new technology; focused ultrasound (FUS), not only with respect to movement disorder but also in focused drug

delivery. In this effort, we are also collaborating with the Departments of Radiology and Neurology.

Our research coordinator, **Charlene Aldrich**, is responsible for much of our clinical success with FUS. We now have received FDA approval for Essential Tremor treatment, completed a pilot study of Parkinson's Disease, and will begin a much larger pivotal study around the New Year. We are also collaborating with the Department of Radiology, particularly with **Dheeraj Gandhi, MD** in a pilot study for the treatment of neuropathic pain. Finally, in this regard, due to the work of **Graeme Woodworth, MD** and his colleagues in animal models, Graeme is about to start a human study that should lead to enhanced drug delivery to brain tumors.

Graeme's lab also developed a transgenic brain tumor model in rats that has important advantages over previously established mouse models,

both in understanding drug delivery and tumor biology.

In the area of stroke, **Marc Simard, MD's** drug Cierra (the IV formulation of the sulfonylurea glyburide) was sold to Biogen for over \$100 million and should be soon on its way to the market. This achievement marks the first time we have gone from the laboratory to trials and then to market. Marc and his colleagues also showed the co-localization of the SUR1 trpm4 sulfonylurea channel and aquaporin4 a water channel, showing that together they form a major cause of brain edema.

Sincerely,

**Howard M Eisenberg, MD**,  
R.K. Thompson Professor and Chair of  
the Department of Neurology

## LETTER FROM THE CHAIR OF NEUROLOGY



Welcome to the inaugural issue of the **Clinical Neurosciences Update**, a joint publication of the Departments of Neurology and

Neurosurgery at the University of Maryland School of Medicine. We hope that this and future issues will bring to light some of the tremendous clinical work and compelling research our colleagues are accomplishing in in both departments.

Since my start as Chair of the Department of Neurology in July 2016, we have made great progress in patient access, safety, follow-up, and education. The department provides top-quality care to patients from Baltimore, across Maryland, and from states spanning the East Coast. Our faculty physicians are trained in a wide range of disciplines to care for patients suffering from a large number of neurological disorders:

- Our Comprehensive Stroke Center is among the busiest in the state, where we receive and handle over 1500 "Brain Attack Team" calls per year.
- Our vascular neurologists provide advice to area hospitals and facilitate transfers to the University of Maryland Medical Center for patients to receive thrombolysis and to undergo sophisticated intra-arterial procedures that will remove clots and prevent permanent brain injury from stroke.
- Our Neuro-Critical Care Unit provides cutting-edge care for critically ill patients with intracerebral hemorrhage, subarachnoid hemorrhage, stroke, traumatic brain injury, and status epilepticus.
- The University of Maryland Epilepsy Center has a Level 4 designation, and offers a full range of care including clinical trials for seizure medications, and the options for intracranial EEG monitoring, epilepsy surgery, and responsive neurostimulation.
- The Movement Disorders Center is engaged in a number of clinical trials to treat Parkinson's disease and provides state-of-the-art deep brain stimulation to treat medically refractory Parkinson's disease.
- The Multiple Sclerosis Center also has a number of clinical trials underway for new medications to slow the progression of multiple sclerosis, as well as a busy infusion center for the treatment of multiple sclerosis and other neuro-immunological conditions.
- Finally, physicians in our Neuro-muscular Diseases program treat a broad range of disorders from peripheral neuropathy to amyotrophic lateral sclerosis.

Even with this wide range of services, our department is continuing to grow. Soon, we hope to launch new and advanced programs in dementia, neuro-oncology, and child neurology. Here in Neurology at the University of Maryland, translational neuroscience research remains a priority. Through this commitment, we are confident that that our faculty will continue to make new discoveries for the benefit of all in the future.

Sincerely,

**Peter B. Crino MD, PhD**  
Professor and Chair  
Department of Neurology

# A BEST-KEPT SECRET REVEALED:

## *UM Epilepsy Center Continues to Raise the Bar on Clinical Excellence*

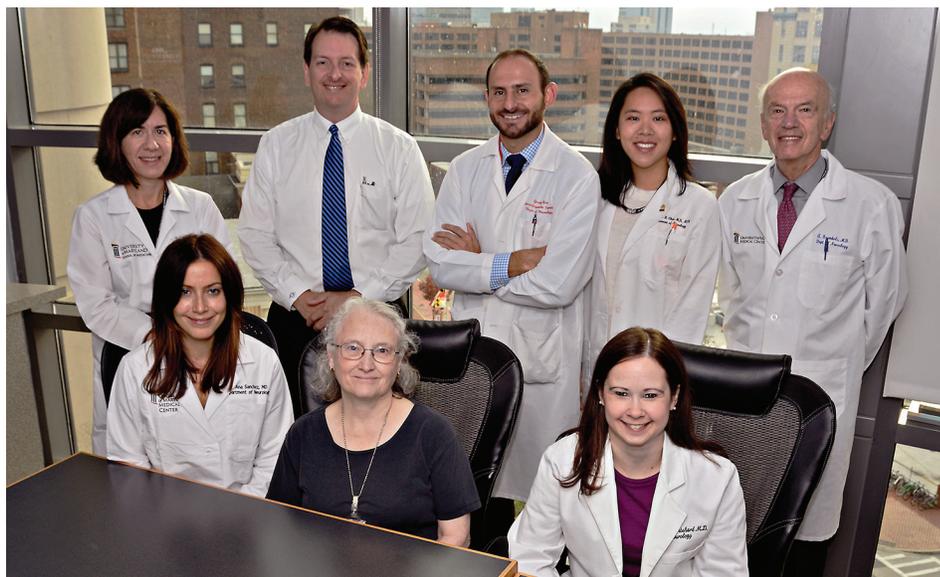
It can start with symptoms ranging from a simple staring spell to sudden, violent shaking. Such seizures are the hallmark of epilepsy, a neurological condition that affects some 3.7 million people in the US today, with 150,000 new cases appearing every year.

For those who think they have this disorder, an immediate priority is to find a trusted practice center that will confirm that diagnosis and offer a successful treatment plan to relieve the onset of their seizures. Last year, for more than 2,000 patients with epilepsy and related neurological disorders, the University of Maryland Epilepsy Center was their first choice, with an additional 4,800 visiting for diagnostic testing. The Center's collaborative structure provides a seamless continuum of care, so that patients can move from assessment to treatment that includes advanced surgical procedures through the Department of Neurosurgery.

"We've been called a best-kept secret," says **Jennifer L. Hopp, MD**, an Associate Professor of Neurology at the University of Maryland School of Medicine (UM SOM) and Director of the Center, a division of SOM's Department of Neurology. "Many people in Maryland don't realize that



Dr. Howard Eisenberg performs neurosurgical procedures.



Epilepsy Surgery team members (L to R standing) Jennifer L. Hopp, MD; Peter B. Crino, MD, PhD; Camilo A. Gutierrez, MD, Stephanie Chen, MD; Allan Krumholz, MD; (L to R seated) Ana M. Sanchez, MD; Elizabeth Barry, MD; Jennifer M. Pritchard, MD. (Pictured below: Howard M. Eisenberg, Chair of the Department of Neurosurgery.)

we do have an exceptional level of expertise and experience here as a Level 4 Center. Even so, we maintain one of the highest patient volumes in Baltimore-Washington area."

The Level 4 designation, awarded by the National Association of Epilepsy Centers (NAEC), distinguishes those few centers that offer the most complex forms of intensive neurodiagnostic monitoring, along with extensive surgical, medical, neuropsychological, and psychosocial treatment. The center first achieved its Level 4 designation some 30 years ago.

Having such a comprehensive range of testing and treatment options on site delivers a superior standard of care, notes Dr. Hopp. "We really work to make certain that we have the latest diagnostic and treatment strategies available for our patients," she notes. "We also maintain a highly personal patient approach through a group of faculty who are

very dedicated to patient care, but at the same time have very exciting novel research interests. As a result, we're able to approach the whole patient from a number of different dimensions. When a patient comes into the center, we address their complete spectrum of needs, which is a unique advantage."

### **Comprehensive Testing**

When a prospective patient is admitted for evaluation, the first step is to determine if they are indeed epileptic, which can be difficult to determine. About a third of admitted patients are found not to suffer from epilepsy but from another "mimicking" cardiac or psychiatric condition, opening the door for more appropriate treatments. In

**ON COVER:** Epilepsy patient Ean Spencer meets Jennifer Hopp, MD, Director of the Maryland Epilepsy Center, in the Center's Epilepsy Monitoring Unit (EMU).

**“Many people in Maryland don’t realize that we do have an exceptional level of expertise and experience here as a Level 4 Center. Even so, we maintain one of the highest patient volumes in Baltimore-Washington area.”**

—JENNIFER L. HOPP, MD

making an accurate diagnosis, center physicians and technicians rely on an array of advanced monitoring and imaging technologies to pinpoint the source of a patient’s seizures. Those who require a more thorough assessment will spend several days at the center’s state-of-the-art four-bed Epilepsy Monitoring Unit (EMU), which provides inpatient continuous video-electroencephalography (cEEG) monitoring, managed by in-house EEG technicians 24/7. This dual monitoring allows physicians to compare electrical spikes in brain activity with observable seizure episodes over a period of days, and to observe whether certain medications can bring seizures under control.

The invaluable use of cEEG monitoring actually extends beyond the EMU to the entire medical center’s intensive care units, through a program directed by **Jennifer M. Pritchard, MD**, an Assistant Professor of Neurology who is director of the Epilepsy Center’s cEEG Monitoring Program and co-director of the Clinical Neurophysiology-EEG Laboratory. “The reason that continuous EEG is so useful is that we can see when a comatose patient is experiencing a seizure even when they don’t have any clinical manifestations,” she says. “Besides supporting more accurate diagnoses, continuous EEG may give us information on how patients might do in cases of hypoxic ischemic brain injury or cardiac arrest. So, it’s an important piece of the puzzle in providing information that connects with brain imaging and clinical exams.”

## **New Imaging, Sleep Disorder Approaches**

For the Center’s **Stephanie Chen, MD**, Assistant Professor of Neurology, MRI or PET scans are just the starting point in exploring what blend of imaging approaches might work best in pinpointing the sources of seizures in a patient’s brain. As technology improves and more advanced imaging platforms become available, Dr. Chen’s research goal is to find an ideal combination of modalities that achieve a greater precision than is available presently. “Data has shown that if we can identify accurately the seizure focus through imaging, the surgery outcomes of patients are better,” she notes. “We want to give the neurosurgeon a more precise target.”

Another dimension of epilepsy management is the area of sleep disorders. **Ana M. Sanchez, MD**, Assistant Professor of Neurology, is an Epilepsy and Sleep Medicine specialist who is studying the intersection of seizures and sleep disorders. “I am interested in the interface of epilepsy and sleep,” she says. “Some seizures are more likely to arise from sleep, and it may be possible that by effectively identifying and treating sleep disorders, we can actually improve seizure control both during sleep and wakefulness.”

## **Multiple perspectives**

Drawing from their diagnostic perspectives, Drs. Hopp, Chen, Pritchard, and Sanchez meet several times a month with other members of the Epilepsy Center team for an interdisciplinary

epilepsy surgery conference. The group, which includes eight epileptologists as well as radiologists, neuropsychologists, and neurosurgeon **Howard Eisenberg, MD**, Professor of Neurosurgery and R.K. Thompson Chair of the Department of Neurosurgery, present their data in discussing each patient case in an individualized manner. On average, about two-thirds of diagnosed epilepsy patients can be treated successfully through medication therapy; however, for the remaining one-third, epilepsy surgery may offer them the best chance at seizure freedom.

“For surgery candidates, we assess if further invasive or non-invasive testing needs to be done, such as implantation of electrodes on the brain’s surface,” says Dr. Hopp. “We then determine whether we can resect (remove tissue from) an area of the brain that is responsible for causing the seizures without compromising other key functions.” If the patient is not a candidate for resective surgery, the center offers other high-tech options to control seizures through implanted devices that include the NeuroPace-Responsive Neurostimulation System (RNS)<sup>™</sup> and Vagus Nerve Stimulation (VNS)<sup>™</sup>.

“The rates of seizure freedom depend upon epilepsy type, but our efficacy rate is very high with a low complication rate,” notes Dr. Hopp. “Moving forward, our focus is on novel treatments that improve our effectiveness but also allow our patients to return to work and their lives more quickly.” ■

To learn more about the Maryland Epilepsy Center, visit <http://www.umm.edu/programs/neurosciences/services/epilepsy>. To make an appointment with a Center epilepsy specialist, please call 410-328-4323.

## FOCUSED ON A CURE:

### *Pivotal Neurosurgery Study Is Final Test Before FDA-Approved Use of Focused Ultrasound to Treat Parkinson's Disease*

Researchers at the University of Maryland Department of Neurosurgery are leading a new phase-3 study to test the safety and efficacy of using MRI-guided focused ultrasound on the brain to treat Parkinson's disease. The pivotal study is the final step before the U.S. Food and Drug Administration (FDA) will consider approving the new technology for widespread use as a nonsurgical treatment option to eliminate key motor symptoms of this common neurological condition.

“The goal of the focused ultrasound treatment is to both lessen the main symptoms of Parkinson's disease, which include tremors, rigidity and slow movement, as well as treat the dyskinesia that is a medication side effect, so that less medication is needed,” says principal investigator **Howard M. Eisenberg, MD, R.K. Thompson** Professor and chair of Neurosurgery at UMSOM and Chief of Neurosurgery at the University of Maryland Medical Center.

Funded by Insightec, the multi-site Parkinson's study is expected to begin in January 2018 with the University of Maryland Medical Center as the primary treatment site. Dr. Eisenberg serves as a consultant to Insightec.

### **Non-Invasive Technique**

MRI-guided focused ultrasound is a noninvasive technique that uses sound wave energy to ablate cells within the body. Magnetic resonance imaging (MRI) allows doctors to define the target inside the body. In this case, doctors guide ultrasound waves through the skin and skull to precisely target the globus pallidus, a structure deep in the brain that helps regulate voluntary movement.



Dr. Howard Eisenberg (foreground right) directs MRI-guided focused ultrasound procedure, assisted by Dr. Graeme Woodworth (background left) with patient.

**“The goal of the focused ultrasound treatment is to both lessen the main symptoms of Parkinson's disease...as well as treat the dyskinesia that is a medication side effect, so that less medication is needed.”**

—HOWARD M. EISENBERG, MD, R.K. THOMPSON PROFESSOR AND CHAIR OF NEUROSURGERY, UMSOM AND CHIEF OF NEUROSURGERY, UMMC

This approach does not use radiation or surgery.

As many as one million Americans have Parkinson's disease, a chronic, degenerative disorder for which there is no cure. The second most common movement disorder, Parkinson's disease results from the malfunction or loss of brain cells crucial for movement and coordination. Symptoms include motor difficulties such as tremor, rigidity and impaired balance. People with Parkinson's can also experience non-motor symptoms of cognitive impairment, depression and anxiety, and autonomic dysfunction.

Current treatments include medication, with levodopa being the most widely used. In advanced cases, deep brain stimulation with surgically implanted micro-electrodes is used to treat motor symptoms of tremor, rigidity and dyskinesia. Dyskinesia (abnormal, distorted movement) is a common medication side effect that can drastically affect quality of life for patients with Parkinson's.

## Promising Results

This is the second clinical trial of MRI-guided focused ultrasound for Parkinson's disease. The original pilot study, also led by University of Maryland Medicine, began in 2015 and showed promising results.

"The results of the pilot trial, so far, are very encouraging," says Dr. Eisenberg of the ongoing trial that

involved 20 patients, most of whom were treated at the University of Maryland Medical Center.

The first pilot trial focused on a subset of patients who had symptoms that were worse on one side of the body, as well as severe dyskinesia where medication had failed. The patients received focused ultrasound and most experienced significant improvement in their tremors. The new larger study aims for 110 participants, and is designed with a softer inclusion criteria, so more patients will be eligible.

## "An Appealing Alternative"



**Dr. Fishman**

because it does not involve surgery," says **Paul S. Fishman, MD, PhD**, professor of neurology at UMSOM and a neurologist at the University of Maryland Medical Center.

The procedure itself is performed in an outpatient setting. The patient is awake the entire time, lying in an MRI scanner with a head-immobilizing frame fitted with a transducer helmet, which converts energy from one form to another. Ultrasonic energy is targeted through

the skull to the globus pallidus of the brain, and images picked up during the procedure give doctors a real-time temperature map of the area being treated. Doctors raise the temperature in a very restricted area of the brain to ablate tissue. During the procedure, the patient is alert and giving feedback, which allows doctors to monitor the immediate effects of treatment and make adjustments.

"University of Maryland Medicine is a world leader in pioneering MRI-guided focused ultrasound to become a new standard of care for treating many devastating brain diseases including Parkinson's, essential tremor and glioblastoma, an often deadly type of brain cancer," says **E. Albert Reece, MD, PhD, MBA**, vice president for medical affairs at the University of Maryland and the John Z. and Akiko K. Bowers Distinguished Professor and Dean of UMSOM. ■

For more information about this or other clinical trials for Parkinson's Disease, please contact Charlene Aldrich, RN, MSN, clinical research manager, at 410-328-5332.

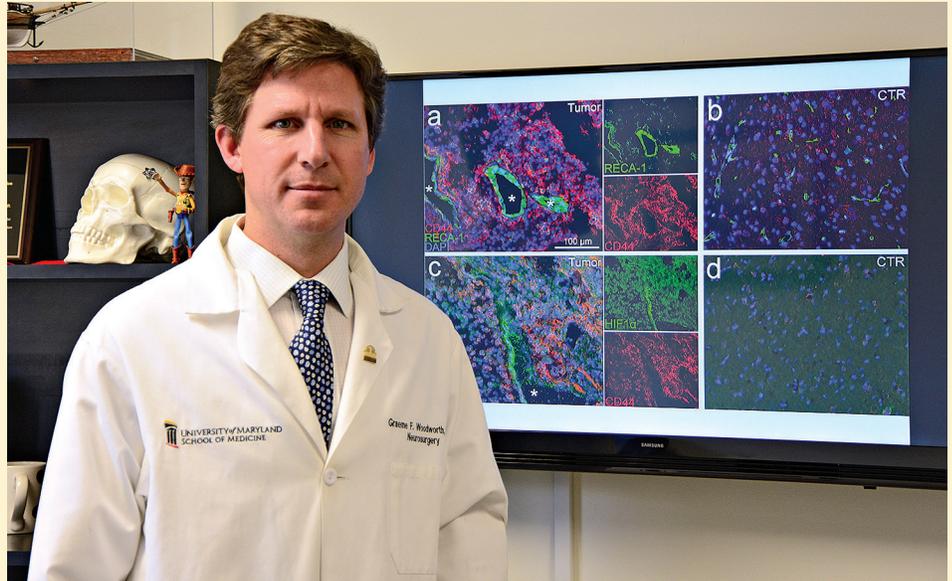
**"University of Maryland Medicine is a world leader in pioneering MRI-guided focused ultrasound to become a new standard of care for treating many devastating brain diseases including Parkinson's, essential tremor and glioblastoma, an often deadly type of brain cancer."**

—E. ALBERT REECE, MD, PHD, MBA, VICE PRESIDENT FOR MEDICAL AFFAIRS  
AT THE UNIVERSITY OF MARYLAND AND THE JOHN Z. AND  
AKIKO K. BOWERS DISTINGUISHED PROFESSOR AND DEAN OF UMSOM.

## Graeme F. Woodworth, MD, FACS

As the Director of the Brain Tumor Treatment and Research Center at the University of Maryland School of Medicine (UMSOM), I provide leadership and surgical care within a multidisciplinary team of radiologists, medical oncologists, radiation oncologists, neurosurgeons, and pathologists, treating brain cancer patients. This clinical role enables me to facilitate the cross-disciplinary group of engineers, cancer biologists, and clinician-scientists within the Translational Therapeutics Research Group (TTRG) to address key challenges in counteracting the patho-biology and improving the treatment of brain cancer.

Much of this work is centered on the concept of using the operating room as a portal for discovery and opportunity to improve our understanding of and therapeutic delivery for brain cancer. I study and utilize advanced brain tumor models, including genetically-engineered and patient-derived versions directly from the operating room where the tumor tissue is rapidly passaged in vivo to avoid ischemia and biological transformation during extended manipulations or culturing conditions. We have developed a nestin-TV-A transgenic rat model to enhance investigations into the molecular and cellular mechanisms of the glioblastoma margin (GBm) and enable surgery-, local delivery-, focused ultrasound-, and targeted radiation-based studies.



Graeme F. Woodworth, MD, FACS, Associate Professor, Department of Neurosurgery and Director, UMSOM Brain Tumor Treatment and Research Center

A long-standing goal in treating patients with glioblastoma (GB), the most common and deadly primary brain cancer, is linking tumor specific features with effective anti-tumor therapies to generate long-term treatment responses. I believe that following the principles of maximal, safe tumor removal, use of intra-operative access to better understand the disease and deliver therapies, and targeting therapeutics to residual/ unresectable invading cancer elements, we will turn GB from a uniformly fatal cancer into a chronic disease with the potential for cure.”

*Dr. Woodworth is an Associate Professor in the UMSOM Department of Neurosurgery, with secondary appointments in Diagnostic Radiology, Nuclear Medicine, Anatomy, and Neurobiology. ■*

**“Much of this work is centered on the concept of using the operating room as a portal for discovery and opportunity to improve our understanding of and therapeutic delivery for brain cancer.”**

—GRAEME F. WOODWORTH, MD, FACS

# A CENTER FOR EXCELLENCE IN BRAIN RESEARCH

The international Focused Ultrasound Foundation has designated the University of Maryland School of Medicine (UMSOM) as a Center for Excellence, one of only seven institutions in the world so designated by that organization.

In citing UMSOM's leadership in advancing focused ultrasound research for the brain, the Foundation specifically recognized the efforts of two UMSOM physicians in managing a comprehensive bench-to-bedside program that expanded technologically-assisted neurosurgical capabilities as well as innovating new methods for delivering therapies to the brain—namely, **Howard M. Eisenberg, MD** and **Elias R. Melhem, MD**. Dr. Eisenberg is Professor, the Raymond K. Thompson, MD Chair in Neurosurgery, and Department Of Neurosurgery Chair, while Dr. Melham is Professor, the Dean John M. Dennis Chair in Radiology, and Chair of Department Of Diagnostic Radiology & Nuclear Medicine.

“The University of Maryland has created a dream team of experts in neurosurgery, neuroradiology, neurology, and biophysics that is collaborating to establish new frontiers to optimize the technology to treat a range of neurologic and psychiatric disorders,” says Foundation Chairman **Neal F. Kassell, MD**.

Both Drs. Eisenberg and Melham have a long-standing interest in focused ultrasound (FUS). Dr. Eisenberg had served as a consultant to the Foundation for over a decade. Dr. Melhem initially became aware of FUS while at the University of Pennsylvania and hearing a talk given by Ferenc Jolesz some 10 years ago. “This really captured my imagination for the potential of the technology,” says Melhem. He was not able to obtain a system at Penn, but as he was being recruited to be Chairman of the Radiology Department at UMSOM in 2012, he solicited support from UMSOM's to invest in the creation

of a hub for focused ultrasound research. Since then he has invested in an Insightec Exablate clinical platform and basic science systems. The Departments of Radiology, Neurology and Neurosurgery have since collaborated to create a multidisciplinary team of experts that has attracted more than \$500,000 in research grants to date and laid a pipeline for future funding. ■



Maryland's "Brain Trust:"(L to R)  
Front: Dr. Victor Frenkel, Dr. Graeme Woodworth, Kaitlyn Henry, Charlene Aldrich, Dr. Howard Eisenberg. Middle: Andy Hebel, Dr. Paul Fishman, Dr. Elias Melhem, Dr. Deeraj Gandhi. Back: Liz Rolon, Dr. Rao Gullapalli, Pam Janocha, Erma Owens.



**“The University of Maryland has created a dream team of experts in neurosurgery, neuroradiology, neurology, and biophysics that is collaborating to establish new frontiers to optimize the technology to treat a range of neurologic and psychiatric disorders.”** —NEAL F. KASSELL, MD

# ADVANCES IN RESEARCH

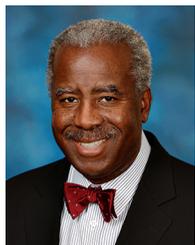
Stroke remains the 3rd most common cause of death in the United States. Two members of the University of Maryland Comprehensive Stroke program, **Steven Kittner, MD, MPH**, Professor of Neurology, and **John Cole, MD**, Associate Professor of Neurology, were recently co-authors on a paper published in the *Annals of Neurology* that identified new genetic risk factors for stroke in young individuals.



**Dr. Shulman**

As a member of the “Parkinson Study Group Healthcare Outcomes and Disparities Working Group”, **Lisa Shulman, MD**, Professor of Neurology, and colleagues found in

a study published in *Neurology* that the utilization of neuro-rehabilitation services for Parkinson’s Disease patients in the U.S. was less than other countries with comparable health care infrastructure.



**Dr. Royal**

In a study published in the *Journal of Neurovirology*, **Walter Royal III, MD**, Professor of Neurology, examined a cohort of patients with HIV-associated neurocognitive

disorders (HAND) in Nigeria, and reported that levels of blood lymphocyte HIV DNA and degree of cognitive impairment were correlated, independent of blood levels of HIV mRNA. These findings suggest that HAND severity may be dependent on the HIV reservoir and the amount of active viral replication.

Two members of the University of Maryland Comprehensive Epilepsy Center, **Jennifer Hopp, MD**, Associate Professor of Neurology, and **Allan Krumholz, MD**, Professor Emeritus of Neurology, were co-authors on a paper published in *Epilepsia* that evaluated the individualized system of assessing driving applications with epilepsy here in the State of Maryland. With the challenges of assessing risks to drivers with epilepsy evaluated in each state, this study showed that Maryland’s individualized assessment program delivered a higher percentage of safely licensed drivers who were treated for epilepsy.

**Neeraj Badjatia, MD, MS**, Professor of Neurology and Director of Neuro-Critical Care, wrote a definitive monograph on the role of therapeutic hypothermia (TH) in the setting of acute neurological injury in the *Handbook of Clinical Neurology*. TH is widely used in the Neuro-Critical Care unit here at the University of Maryland in an attempt to prevent brain injury resulting from cardiac arrest.

**NIH GRANT SUPPORT:** Three members of the Department of Neurology—**Daniel Harrison, MD**, Assistant Professor of Neurology; **Steven Kittner, MD, MPH**, Professor of Neurology; and **Walter Royal III, MD**, Professor of Neurology—were awarded research grants from the National Institutes of Health.



**Dr. Simard**

In the agreement made between **Marc Simard, MD, PhD**, Professor of Neurosurgery, and Biogen (mentioned in the Chair’s Letter), Biogen is providing an additional \$50

million to fund a multicenter clinical trial to study Glyburide in patients with hemorrhagic stroke.



Joining the Department of Neurology faculty are (L-R) **David R. Benavides, MD, PhD**; **Camilo A. Gutierrez, MD**; **Philip H. Iffland, MA, PhD**; and **Chandana Chauhan, MBBS**.

Marc now has his second R01 funded and a third R01 was scored well within the funding line and we should hear positively this month.

The FDA has approved **Graeme Woodworth, MD**’s multicenter pilot study to transiently open the blood brain barrier in patients with malignant brain tumors, a proof of concept drug delivery study. The idea is to improve drug delivery to the invasive edge of a tumor where the barrier is intact.

Regarding our other MRg FUS clinical studies, the pilot Parkinson’s study has enrolled 20 patients and a preliminary look at the data is extremely encouraging. A pivotal multi-centered study including 110 patients will be managed by the Department of Neurosurgery and InSightec (the parent company) and will start in the New Year. A third pilot study focused on the treatment of Neuropathic pain lead by **Dheeraj Gandhi, MBBS**, Professor of Diagnostic Radiology and Nuclear Medicine, has been approved by the FDA and will also start in the New Year.

CONTINUED ON PAGE 10

# CLINICAL HIGHLIGHTS

CONTINUED FROM PAGE 9

Our clinical trials program headed by Charlene Aldrich is currently managing 10 clinical studies. In addition to MRg FUS studies, many are directed to traumatization of stroke and traumatic injury including the evaluation of intrathecal and intracisternal nimodipine where the site PI is **Francois Aldrich, MB, ChB, MMed, FCS**, Professor of Neurosurgery. Others involve spinal cord injury where the site PI is **Bizhan Aarabi, MD**, Professor of Neurosurgery.

**Dr. Anthony Kim, PhD**, Assistant Professor of Neurosurgery, has a R01 that was scored well within the funding line, and on which we should hear positively this month. An urgent need in the clinical management of most solid tumors (e.g. breast, brain cancers) is effective delivery of therapeutics to the cancer cells that escape current treatments, which leads to tissue invasion, metastasis, and tumor recurrence. The goal of this study is to develop Fn14-targeted, tumor-penetrating nanoparticles to more effectively deliver chemotherapeutics to TNBC primary tumors and metastases. Successful completion of this study will provide new insights into the rate-limiting drug delivery barriers for TNBC and other cancers, which will allow flexibility to deliver other targeted agents, novel drugs, and/or combination therapies to tailor the treatment strategy to individual TNBC patients. ■

The inpatient Neurology service will be changing this November with the development of a **Neuro-Hospitalist program**. Neurology inpatients will be cared for by neuro-hospitalists, who are neurologists who specialize in hospital care and focus on quality improvement, patient safety, and throughput from admission to discharge.

Several new clinical programs are being developed in the Neurology including headache, neuro-oncology, cognitive neurology and dementia, and neuromuscular disease.

The FDA has approved MR guided focused ultrasound (MRg FUS) for the treatment of essential tremor. While we are waiting for CMS to provide professional fees, we can only provide this service to self-paying patients. However, patients are visiting our department for this treatment from as far away as the West Coast, Latin America, and even India.

Two neurosurgeons have joined our spine surgical effort led by **Charles Sansur, MD, FAANS**, Associate Professor of Neurosurgery. **Gary Schwartzbauer, MD, PhD, FAANS**, Associate Professor of Neurosurgery, will spend 50 percent of his time doing spine surgery. During the other half of his time, he will pursue his other clinical interest, neurocritical care, strengthening our presence in the University and Shock Trauma neuro-intensive care units. **Kenneth Crandall, MD**, Assistant Professor of Neurosurgery, will divide his time between the University and UM St. Joseph Medical Center. Ken just completed a minimally invasive spine surgery fellowship in Miami. As an added benefit, he will expand our clinical effort in the UMMS community. **Graeme Woodworth, MD, FACS**, Associate Professor of Neurosurgery, staffs a brain tumor clinic at UM SJMC as well. ■

## UMSOM Neurosciences Scores with the NFL



Both the **Neurosurgery and Neurology Departments** are teaming up with the National Football League to study and reduce the risks of player concussions. When it's game day at Baltimore's M&T Bank Stadium, you can expect to see members of UMSOM's **Department of Neurosurgery** standing on the sidelines with both the Baltimore Ravens and their visiting opponents. Since 2013, a team of four Department neurosurgeons (Howard M. Eisenberg, MD; E. Francois Aldrich, MB, ChB; Gary T. Schwartzbauer, MD, PhD; and Graeme F. Woodworth, MD, FACS) along with Brian N. Corwell, MD from the Department of Emergency Medicine have participated in the NFL's Unaffiliated Neurotrauma Consultants program. The Neurosurgery team works with team physicians in observing players on the field during play and reporting if they believe a possible concussion or other neurological injury has occurred. The team also performs initial examinations of players pulled from the game both on the sidelines and in the locker room.

In addition, the **Department of Neurology** is now working collaboratively with the NFL as part of the "Brain Assessment Program" of former NFL players. The program, created in 2013 as part of a legal settlement, is open to all retired NFL players. Those found to have neurological impairment receive further testing and treatment. ■

# A SINGULAR DETERMINATION, A DONOR'S GENEROSITY

## *Second Annual Myers Memorial Symposium Shares Critical Information for Patients and Caregivers on Parkinsonian Disorders*

On Tuesday, October 10, the Department of Neurology hosted the second annual Stephen K. Myers Memorial Symposium on Multiple System Atrophy and Other Parkinsonian Disorders for Patients and Caregivers. The symposium, which was held at the Baltimore Marriott Inner Harbor at Camden Yards, focused on Multiple System Atrophy (MSA) and other rare neurodegenerative diseases, including Lewy Body Dementia, Corticobasal Degeneration, and Progressive Supranuclear Palsy, collectively known as parkinsonian disorders. National speakers and faculty members from the Department of Neurology were featured.

After conversations in 2016 with the School of Medicine's **Stephen G. Reich, MD**, Frederick Henry Prince Distinguished Professor in Neurology, Ms. Carol Shaffer Smith made a generous contribution to sponsor the annual symposium through 2021. Her motivation, she says, came from "a desire to help patients with these rare and fatal neurodegenerative diseases have the best quality of life possible."

Imagine having a loved one diagnosed with a rare and fatal disease, and then finding little information available to help deal with the ever evolving and difficult challenges of daily living. That was the dilemma facing Ms. Shaffer Smith when her adult son Stephen was diagnosed with MSA, an incurable parkinsonian disorder. Parkinsonian disorders all share many of the recognizable symptoms as Parkinson's disease, but are in fact individually rare "orphan" diseases.

For Ms. Shaffer Smith, the shock of her son's illness was quickly compounded when she found that no information existed for patients or caregivers on managing the evolving daily challenges of living with a progressive neurodegenerative disorder. "There are just all kinds of things that occur during the disease's progress," she says. "It's very difficult to see someone suffer so much when there may be ways to reduce their discomfort. But with no place to go for the right information, you just don't know what to do."

After Stephen's passing, she was even more determined to address this issue, and in her words, "to help others who face the same challenge that I did." To do so, she reached out to the UM Department of Neurology's Dr. Reich, who had been Stephen's physician and the first to correctly diagnose his condition. Together, they came up with the idea of a yearly public symposium that would accomplish two goals—to provide the most current information on parkinsonian disorders as presented by national and local experts, while offering a networking opportunity for attending patients and their caregivers.

"In dealing with parkinsonian disorders, patients and their caregivers often are left feeling alone and without resources to manage the disease," notes Dr. Reich. "What's why it's important to have a forum, where they can connect with knowledgeable physicians who can provide useful information to promote the patient's quality of life."

The success of the symposium has fulfilled a personal mission for Ms. Shaffer Smith. "I just want to make



Stephen Reich, MD, UMSOM Department of Neurology and philanthropist Ms. Carol Shaffer Smith

more information available regarding the problems that arise in daily living for people who have these awful diseases, as well as the challenges and emotional stress that their families face," she says. "Some of the caregivers as well as family members came up to me in tears after I spoke, thanking me for putting their suffering into words. I was deeply touched by the response." ■

**"I just want to make more information available regarding the problems that arise in daily living for people who have these awful diseases, as well as the challenges and emotional stress that their families face."**

—CAROL SHAFFER SMITH

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## OF NOTE

In May 2017, the Department of Neurology hired **David Benavides, MD, PhD** as Assistant Professor. Dr. Benavides completed a post-doctoral fellowship in neuroimmunology at Johns Hopkins University and specializes in caring for patients with a variety of autoimmune neurological disorders including multiple sclerosis, vasculitis, and autoimmune encephalitis. His research interests include understanding the molecular mechanisms that cause autoimmune encephalitis.

In August 2017, we welcomed **Phillip Iffland II, PhD** to the Department of Neurology as a Research Associate. Dr. Iffland is a neuroscientist who works on the molecular causes of developmental malformations of the brain associated with epilepsy, autism, and intellectual disability.

In September, **Camilo Gutierrez, MD** joined the Department as Associate Professor of Neurology. Dr. Gutierrez comes to us from Temple University School of Medicine and will join the University of Maryland Epilepsy Center. His specialty is epilepsy, and in particular, surgical treatment of intractable seizures. In addition, he has a research interest

in understanding disparities in the delivery of care to patients with neurological diseases.

The Department of Neurology welcomed **Chandana Chauhan, MBBS** in August 2017. Dr. Chauhan is a neuro-muscular disease specialist and general neurologist whose practice is located at the Midtown Hospital Campus. Dr. Chauhan sees all types of neurological disorders, including headache, neuropathy, stroke, and seizures.

### Alumni

The Annual William J. Weiner M.D. "Town-Gown" Annual Review of Neurology Course was presented at the SMC Campus Center at the end of June 2017 and attracted 93 participants. There were 6 faculty speakers and 2 University of Maryland alumni speakers: **Michael J. Marmura, MD**, currently Assistant Professor in Neurology at Thomas Jefferson University School of Medicine, and **Sandra K. Ruby, MD**, Neurologist and Stroke Medical Director at Carroll Hospital Center.

### Farewells

The Department of Neurology bids a fond farewell to two members of the faculty, **Barney Stern, MD** and **Justin Kwan, MD**. Dr. Stern was the Stewart Greenebaum Endowed Professor in Neurology and served as Interim Chairman of the Department of Neurology from 2013-2016. Dr. Kwan was Associate Professor in Neurology and was the Director of the Amyotrophic Lateral Sclerosis (ALS) Clinic Program. We wish them both success in future endeavors.

### In Memoriam

It is with great sadness that we announce the loss of our youngest faculty member, **David Ibrahimi, MD**, a spine neurosurgeon in the Department of Neurosurgery, after a two-year battle with cancer. We have started to raise money to endow a visiting Professorship in his name. We are grateful to Globus for making a lead gift of \$20,000 to advance this effort. We also were glad to see that former residents from as far away as Seattle travelled to Dr. Ibrahimi's memorial service in September. ■