



A MESSAGE FROM THE CHAIR
Philip E. Stieg, PhD, MD



Dear Friends and Colleagues,

The Weill Cornell Medicine Brain and Spine Center continues to grow at a rapid pace, with new additions and accomplishments every month. Our continued growth is helping us achieve our mission of delivering excellent patient care while uncovering new treatments in the lab and training the next generation of neurosurgeons.

To those ends, in recent months we've added three new faculty members (see page 4), published several significant new peer-reviewed journal articles (page 2), and opened the new Weill Cornell Medicine Center for Comprehensive Spine Care (page 2). We continue to offer the very best in Continuing Medical Education courses and other events—recently adding an innovative new surgical course that used 3-D printed models of infant heads for training (opposite).

I'm especially proud of the work coming out of our pediatric neuro-oncology research laboratories. **Dr. Mark Souweidane**, who has pioneered translational research into the deadly pediatric brain tumor DIPG, recently concluded a Phase I clinical trial testing convection-enhanced delivery of drugs directly to the brain stem (page 3). The learning and publications that will emerge from this trial will certainly advance the science and get us closer to new solutions for these heartbreaking tumors. His colleague **Jeffrey Greenfield, M.D., Ph.D.**, recently published a paper detailing how low-grade gliomas progress into fatal malignancies—and more importantly, how to stop that process (page 2). These two labs are making enormous strides in battling the number one disease killer of children.

We also remain committed to global health, adding Antigua to our roster of nations where we conduct outreach and education to develop local skills (page 3). **Dr. Roger Härtl**, just returned from an educational trip to Iraq, will embark again soon on his annual Mission in Tanzania. Look for coverage of both of those trips in our next issue.

Yours in good health,

Phil Stieg

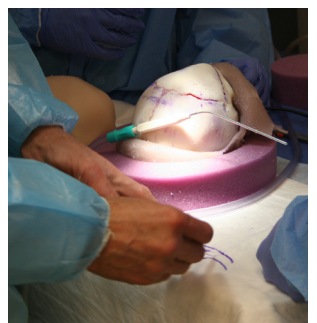
Innovative 3-D Models Allow Hands-On Training for Craniosynostosis

In December, an innovative training course co-directed by neurosurgeon **Mark Souweidane** and plastic surgeon **Jeffrey Ascherman** of Columbia University provided a unique opportunity for young surgeons to acquire hands-on experience repairing craniosynostosis using unique 3-D printed models.



The models were created by **Du Cheng**, a tri-institutional MD/PhD candidate, who has been using 3-D printing to create models of infant heads based on actual patient scans. These intricate models include realistic layers of skin, bone, dura, and brain, allowing trainees to learn and practice the remodeling surgery that these infants require.

These models fill a great need, since remodeling surgery to repair craniosynostosis is a complicated procedure and it has been difficult to train neurosurgeons and plastic surgeons to develop expertise in it. Not only is the condition relatively uncommon, but surgeons are also unable to train on cadavers. This innovation in 3-D printing promises to bring new opportunities for experts to teach these advanced techniques to more young surgeons. This course, held in the state-of-the-art Surgical Innovations Laboratory for Microneurosurgery, allowed more than a dozen young neurosurgeons and plastic surgeons to train under a faculty of experts using these new models.



Approximately one in every 2,000 infants is diagnosed with craniosynostosis, which refers to the premature fusion of bony plates that are meant to keep expanding until the child's rapidly growing brain reaches its full size. The brain continues to grow, but since it can't expand properly in all directions the child's head takes on a distorted appearance—if the prematurely fused suture runs from front to back, for example, the skull cannot expand at the sides and thus expands abnormally front to back, causing an elongated appearance.

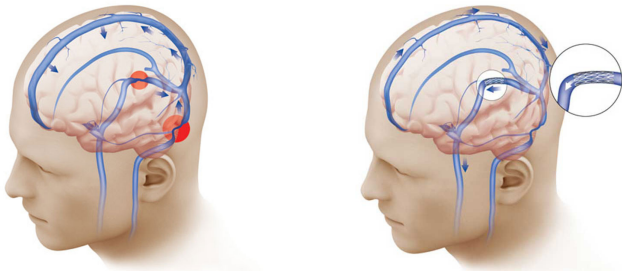
Cranial vault remodeling surgery reopens the prematurely fused sutures, allowing the skull to continue its normal expansion and repairing the distortion in the head shape. The ability of experienced surgeons to use these realistic models will provide an unprecedented opportunity for them to train their young colleagues in this complex procedure.

NOTABLE PUBLICATIONS

Resolving the Symptoms of Pseudotumor Cerebri

"Venous sinus stenting in idiopathic intracranial hypertension: Results of a prospective trial"

The *Journal of Neuro-ophthalmology* has published a paper by **Dr. Athos Patsalides** and **Dr. Marc Dinkin** describing the results of their clinical trial testing the effectiveness of stent placement in patients with intracranial hypertension. The trial was a joint effort of the Departments of Neurological Surgery, Neurology and Neuroscience, and Ophthalmology.



The illustration at left shows bilateral venous sinus stenosis (red circles), which compromises blood flow from the brain. At right, the narrowing has been corrected with a stent, restoring blood flow (blue arrows) and resolving the symptoms of intracranial hypertension, or pseudotumor cerebri.

The clinical trial evaluated the safety and long-term effectiveness of venous sinus stenting in 13 patients with severe IIH who also had stenosis of the large veins of the brain. Published reports had suggested that venous sinus stenting could be a safe and effective treatment option for IIH patients with stenosis, and the results of this trial support that. Of the patients tested, 100 percent showed improvement in vision and resolution of pulsatile tinnitus, and 11 of the 13 reported improvement in or resolution of headaches. There were no serious adverse effects.

An ongoing trial is testing the safety and efficacy of stenting in patients with pulsatile tinnitus and venous sinus stenosis without IIH.

Stopping Glioma Progression

"Malignant astrocytic tumor progression potentiated by JAK-mediated recruitment of myeloid cells"

A new paper from the laboratory of **Dr. Jeffrey Greenfield**, published in the journal *Clinical Cancer Research*, details how it may be possible to stop the progression of a low-grade glioma into a fatal malignancy.

The paper details how a specific population of cells made in the bone marrow are recruited to the brain to facilitate tumor progression and how inhibiting this process may stop tumor progression. JAK inhibitors are known to modulate immune responses in other diseases and interrupt signaling pathways involving proteins implicated in cancer.

Dr. Prajwal Rajappa is the lead author on the study, which demonstrated that key cells could be detected within the blood of glioma patients, confirming data uncovered in the animal models of brain tumors. These cells, CD11b+ myeloid cells, are found in increased levels in patients with Stage IV glioblastoma multiforme (GBM) when compared with levels taken from patients with low-grade (Stage II) glioma. Using a JAK 1/2 inhibitor in mouse models, levels of CD11b+ myeloid cells were reduced in the bone marrow and bloodstream of these animals, which correlated with impaired tumor progression and significantly extended the overall survival in treated animals by preventing the low-grade tumor from transforming into a higher-grade malignancy.

This finding will likely be translated into a clinical trial and may offer new targeted immunomodulation for children and adults diagnosed with a low-grade glioma. FDA-approved JAK 1/2 inhibitor compounds are being used in current clinical practice for various myeloproliferative disorders, and this study suggests that these agents may be appropriate to test in select low-grade glioma patient populations.

In addition to Dr. Greenfield, the paper's senior authors include **Dr. David Lyden**, associate professor of pediatrics and cell and developmental biology at Weill Cornell Medicine and a pediatric neuro-oncologist at Memorial Sloan Kettering Cancer Center, and **Dr. Jacqueline Bromberg**, medical oncologist and researcher at Memorial Sloan Kettering Cancer Center.

New Spine Center Offers Comprehensive Care

The Weill Cornell Medicine Center for Comprehensive Spine Care, a new model for the delivery of integrated spine care, is now open on the Upper East Side. The Center, located on the second floor of 240 East 59th Street, offers appointments with a comprehensive range of spine specialists—including pain management specialists, physiatrists, neurologists, and neurosurgeons—all under one roof.

Under the leadership of **Dr. Roger Härtl**, the state-of-the-art spine center allows those suffering from back pain to receive examinations, treatments, and continuing care in one convenient location. The center is co-directed by **Dr. Bridget Carey** (Neurology), **Dr. Neel Mehta** (Pain Medicine), and **Dr. Jaspal "Ricky" Singh** (Rehabilitation Medicine).

The only such facility of its kind in New York, the Center for Comprehensive

Spine Care promises patients relief not only from back pain, but also from the frustration of navigating the health care maze. A patient whose back pain requires almost any kind of therapy—injections, physical therapy, pain management—will be able to receive services in one comprehensive center. A patient who needs an evaluation by a neurosurgeon has access to that consultation on site as well.



Four neurosurgeons from the Weill Cornell Medicine Brain and Spine Center offer appointments at the new facility. Dr. Härtl is joined by **Dr. Eric Elowitz**, **Dr. Kai-Ming Fu**, and **Dr. Ali Baaj** in offering surgical consultations and pre- and post-operative visits at the Spine Center location. Patients requiring surgery will have those procedures done at the Weill Cornell Medicine campus of NewYork-Presbyterian Hospital.

Dr. Souweidane Treats Final Patient in Groundbreaking DIPG Clinical Trial

Dr. Mark Souweidane recently treated the final patient in his Phase I clinical trial of convection-enhanced delivery (CED) for diffuse intrinsic pontine glioma (DIPG). The trial, which had enrolled 27 patients over the past four years, was designed to test the safety of CED as a means of delivering a therapeutic agent directly to the site of a DIPG tumor.

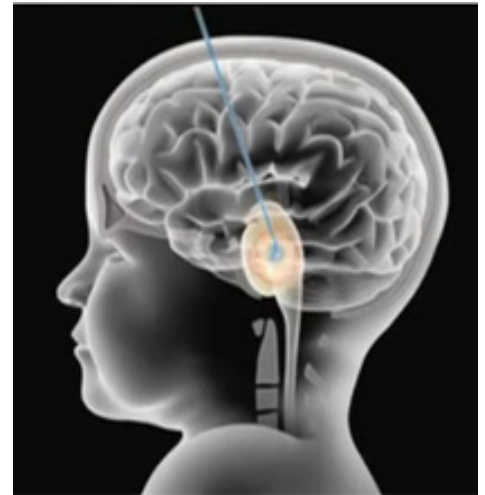
The trial received FDA approval in late 2011, and the first patient was treated in May 2012. In all, 27 children received infusions of 124I-8H9, which consists of the 8H9 antibody (produced by mice and effective against many kinds of tumors) combined with the radioactive substance 124I. The dosage of the drug was increased over the course of the trial, also testing safety, but no dose-limiting side effects occurred in any patient. Several of the children were treated more than once; the final infusion of the trial was the 31st performed.

The infusions, which were done at Memorial Sloan Kettering Cancer Center, were able to deliver the drug directly to the brain stem tumor and were not blocked by the body's protective blood-brain barrier, which normally prevents chemotherapy drugs from crossing into the brain in sufficient concentrations. In this trial, Dr. Souweidane was able to achieve concentrations 1,000 or more times greater than those that can be achieved with IV chemotherapy. He was also able to design and test new ways to measure

those concentrations at the tumor site and monitor how long the drug stayed in the tumor.

Dr. Souweidane and his team will spend the next several months evaluating the data and preparing the results for publication. In the meantime, researchers in the Children's Brain Tumor Project laboratory have been working to pave the road for the next stages of the trial.

Other drugs and drug combinations are being tested to determine what the best agents are to infuse, and at what dose levels. DIPG cell lines are also being grown in the lab, providing a rich source of information about how the tumor mutates over time and responds to different treatments in vitro as well as in animal models.



In this clinical trial, a therapeutic agent was infused directly into the pontine tumor, achieving drug concentrations far higher than possible using systemic administration.

Dr. Hoffman Brings Epilepsy Awareness to Antigua

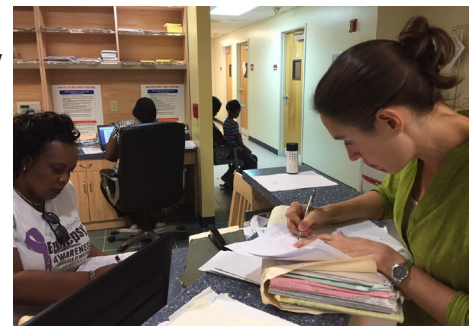
Dr. Caitlin Hoffman recently led a medical team from Weill Cornell Medicine to the Caribbean island nation of Antigua and Barbuda, bringing much-needed expertise in epilepsy to a population that desperately needs it. The Weill Cornell medical team included neurologists/epileptologists, a neuropsychologist, a dietician, and an EEG technician, who collaborated in this effort to improve the skills of local health care providers.

The trip was made possible by a grant from New York art historian and landscape architect **Barbara Paca, Ph.D.**, who is also a Cultural Envoy to Antigua.

The Weill Cornell Medicine team was joined by another group from Dell Children's Medical Center at the University of Texas, Austin. The Dell team was led by Dr. Dave Clark, a pediatric neurologist and sleep specialist, and included another neurosurgeon as well as a physiatrist, EEG technician, and more.

Epilepsy has long been misunderstood and stigmatized in Antigua, and this trip was part of a new annual Epilepsy Week effort to reduce the stigma and improve treatment. Epilepsy Week 2016 was the second such program, much expanded from the previous year's. Experts on this year's trip saw 94 patients at Mount St. John's Medical Centre and Cedar Grove Clinic, providing a vital opportunity for hands-on training of local providers. The U.S. teams also conducted classroom workshops for physicians and educators and a community education talk to improve understanding of epilepsy among the population.

"There is a long history of epilepsy being terribly misunderstood," says Dr. Hoffman. "We assume patients are no longer being stigmatized and misdiagnosed; however, much of that attitude and misapprehension still exists in some parts of the world. This is a tremendous opportunity to demystify a brain disorder and get patients the help they need."



To that end, training included sessions on new classification of epilepsy; managing and selecting anti-epileptic drugs; surgical approaches for epilepsy; and advice about driving during pregnancy for women with epilepsy.

The dignitaries and officials who attended the opening session expressed gratitude for the visiting teams along with hope that improving local skills will greatly improve outcomes. The Minister of Health, Molwyn Joseph, recalled a time not long ago when individuals with epilepsy, including his own sister, needed to travel 1,000 miles to Jamaica for treatment. By improving treatment options at home, and helping to dispel old myths about the disorder, Dr. Hoffman's team hopes to make that situation a distant memory.

NEWYORK-PRESBYTERIAN/WEILL CORNELL MEDICINE
BRAIN AND SPINE CENTER

Cerebrovascular Surgery

Aneurysms, AVMs, Carotid Occlusive Disease

Dr. Philip E. Stieg 212-746-4684

Dr. Jared Knopman 212-746-5149

Brain Tumor Surgery

Benign and malignant tumors in adults and children

Dr. Philip E. Stieg 212-746-4684

Dr. Rohan Ramakrishna 212-746-1996

Dr. Theodore Schwartz 212-746-5620

Dr. Mark Souweidane 212-746-2363 (pediatric)

Dr. Jeffrey Greenfield 212-746-2363 (pediatric)

Dr. Caitlin Hoffman 212-746-2363 (pediatric)

Epilepsy Surgery

Curative and palliative surgical approaches to epilepsy

Dr. Theodore H. Schwartz 212-746-5620

Dr. Caitlin Hoffman 212-746-2363 (pediatric)

Interventional Neuroradiology

Minimally invasive image-guided diagnosis and treatment

Dr. Y. Pierre Gobin 212-746-4998

Dr. Athos Patsalides 212-746-2821

Dr. Jared Knopman 212-746-5149

Movement Disorders

Parkinson's Disease, Essential Tremor, Spasticity, Dystonia

Dr. Michael Kaplitt 212-746-4966

Neuro-oncology

Comprehensive treatment options for cancers of the brain and spine

Dr. Howard Fine 212-746-2596

Dr. Susan Pannullo 212-746-2438

Dr. Rajiv Magge 646-962-2185

Neuropsychology

Testing, Imaging, Psychotherapy, and Cognitive Remediation

Kenneth Perrine, PhD 212-746-2197

Amanda Sacks, PhD 212-746-3356

Jessica Spat-Lemus, PhD 646-962-3336 (pediatric)

Pediatric Neurosurgery

Treatment of the full spectrum of CNS conditions in children

Dr. Mark Souweidane 212-746-2363

Dr. Jeffrey Greenfield 212-746-2363

Dr. Caitlin Hoffman 212-746-2363

Pituitary Tumors/Neuroendocrinology

Endoscopic approaches to anterior skull base surgery

Dr. Theodore H. Schwartz 212-746-5620

Dr. Rohan Ramakrishna 212-746-1996

Dr. Jeffrey Greenfield 212-746-2363 (pediatric)

Dr. Georgiana Dobri 646-962-3556 (neuroendocrinology)

Spinal Surgery

Comprehensive care for spine conditions and injuries

Dr. Roger Härtl 212-746-2152

Dr. Eric Elowitz 212-746-2870

Dr. Kai-Ming Fu 212-746-2260

Dr. Ali Baaj 212-746-1164

Stereotactic Radiosurgery

Noninvasive treatments for brain tumors and other conditions

Dr. Susan Pannullo 212-746-2438

Dr. Rohan Ramakrishna 212-746-1996

NEWYORK-PRESBYTERIAN/LOWER MANHATTAN

Dr. Samuel Kim 646-962-5115

NEWYORK-PRESBYTERIAN/QUEENS

Dr. Ning Lin 212-670-1837

Dr. Louis Cornacchia 212-670-1837

New Faculty



Dr. Georgiana Dobri

Dr. Georgiana Dobri was appointed to the Neurological Surgery faculty to provide care to patients in our new integrated Pituitary and Neuroendocrine Program. Dr. Dobri is a board-certified neuroendocrinologist who specializes in disorders of the pituitary and adrenal glands. She provides medical management and post-surgical therapies to our patients.



Dr. Jessica Spat-Lemus

Clinical neuropsychologist Jessica Spat-Lemus, PhD, joined the department to provide neuropsychological testing, evaluation, and treatment for children with neurological disorders. She rounds out the department's neuropsychology offering, joining adult providers Dr. Kenneth Perrine and Dr. Amanda Sacks-Zimmerman.



Dr. Louis Cornacchia

Dr. Louis Cornacchia has joined the faculty to support our growing neurosurgical practice at NewYork-Presbyterian/Queens. Dr. Cornacchia, a board-certified neurosurgeon who specializes in minimally invasive spine surgery as well as neurosurgical trauma and critical care, is also the director of the Division of Neurosurgery at Brookdale University Hospital Medical Center in Brooklyn.

Awards and Honors

Dr. Roger Härtl, professor of neurological surgery and director of the new Weill Cornell Medicine Center for Comprehensive Spine Care, has been named the AOSpine Regional Educator of the Year. The award was presented at the annual meeting of AOSpine in Davos, Switzerland, in December. Dr. Härtl was honored by the global spine society for his international leadership role in educating neurosurgeons in minimally invasive spinal surgery (MIS) techniques.

Fourth-year resident **Ibrahim Hussain, M.D.**, has been named one of 2017's Charlie Kuntz Scholar Award winners. This prestigious award is given each year to the top 30 neurosurgical residents or fellows for outstanding laboratory or clinical research on spinal disorders. Dr. Hussain won the award for his oral paper presentation, based on work he's done with Dr. Ilya Laufer and Dr. Mark Bilsky at Memorial Sloan Kettering Cancer Center, entitled "Patient-Reported Outcomes After Surgical Stabilization of Spinal Tumors: Symptom-Based Validation of the Spinal Instability Neoplastic Score (SINS) and Surgery." The award will be presented next month at the 2017 Annual Meeting of the Section on Disorders of the Spine and Peripheral Nerves (DSPN).

CME Courses, Seminars, and Workshops

March 3, 2017: Innovations and Updates in the Management of Brain Tumors

April 8, 2017: Principles and Techniques of Complex Spinal Reconstruction

April 20, 2017: Spine Tumor Seminar

May 5, 2017: Neurological Trauma Update

May 19-20, 2017: Advanced Endoscopic Skull Base and Pituitary Surgery

For more information on any of these courses, visit weillcornellbrainandspine.org



Follow the Weill Cornell Brain and Spine Center
on Facebook