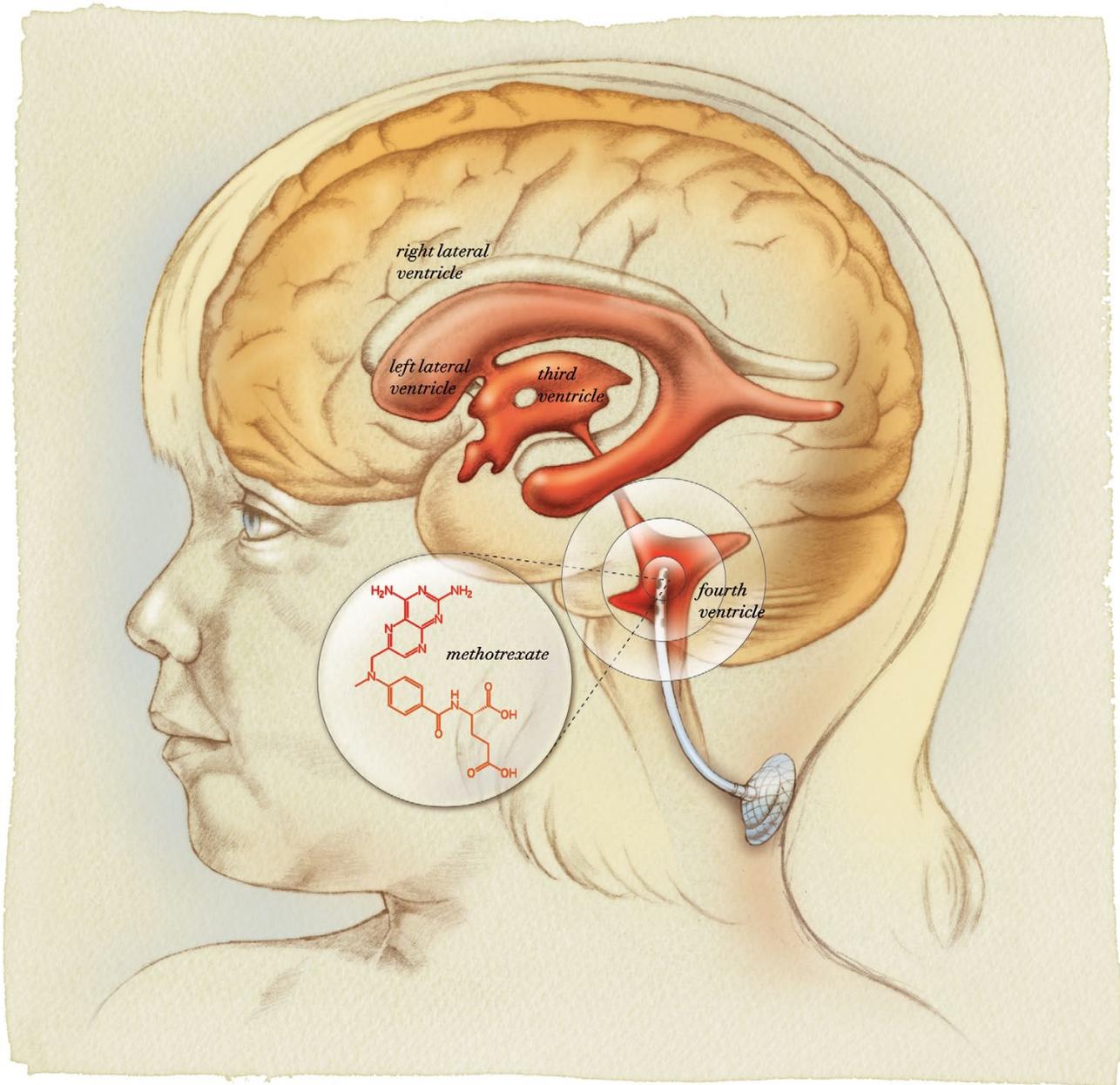


MEMORIAL HERMANN  
MISCHER NEUROSCIENCE INSTITUTE  
JOURNAL

A PUBLICATION FROM MEMORIAL HERMANN-Texas MEDICAL CENTER AND THE UTHealth MEDICAL SCHOOL



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# ATTAINING PEAK PERFORMANCE *in* NEUROSCIENCE

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Precision is a necessity in neuroscience, where the margin for error is small. We continue to expand our capability to treat neurological disease with laser-like precision through advanced technology, the addition of nationally and internationally recognized faculty with subspecialty skills and new partnerships that refine the way we deliver care.

To improve the odds for pediatric brain tumor patients, the Mischer Neuroscience Institute (MNI) at Memorial Hermann-Texas Medical Center and UTHealth Medical School have joined forces with The University of Texas MD Anderson Cancer Center to

establish a unique combined Pediatric Brain Tumor Program. On the Memorial Hermann side, the program is led by David I. Sandberg, M.D., F.A.A.N.S., F.A.C.S., F.A.A.P., director of pediatric neurosurgery at MNI. Dr. Sandberg has conducted translational studies demonstrating the safety of infusing chemotherapeutic agents directly into the fourth ventricle to treat children with malignant brain tumors in this location. This radically new approach allows for precise delivery, minimizing the side effects associated with systemic drug exposure. The treatment is available through a clinical trial only at Memorial Hermann and MD Anderson for children with recurrent tumors in this area of the brain.

We'd like to express our gratitude to Hilary Cannon for sharing her story in this issue of the journal. Diagnosed in 2006 with leiomyosarcoma, a rare malignant tumor of the smooth muscle cells, she was offered palliative care when an aggressive supraclavicular brachioplexus sarcoma threatened the use of her left arm. While other surgeons believed excision to be too technical and high risk, Daniel H. Kim, M.D., F.A.A.N.S., F.A.C.S., a nationally and internationally renowned expert in spinal neurosurgery and reconstructive peripheral nerve surgery, removed the tumor with no deficit.

Congratulations to our Stroke Team for reducing the median door-to-needle time for the delivery of intravenous tPA by 15 minutes at Memorial Hermann-Texas Medical Center. We'd also like to congratulate the 10 physicians affiliated with MNI who were recognized among *U.S. News and World Report's* Top Doctors for 2012. We're proud of their distinction - and of the accomplishments of all of our physicians, nurses, scientists and staff. Their commitment to ensuring the best possible outcomes by providing exceptional patient care is always front and center.

With best wishes,



**DONG H. KIM, M.D.**

Director, Mischer Neuroscience Institute at  
Memorial Hermann

Professor and Chair, Department of Neurosurgery  
UTHealth Medical School



**JAMES C. GROTTA, M.D.**

Co-Director, Mischer Neuroscience Institute at  
Memorial Hermann

Professor and Chair, Department of Neurology  
UTHealth Medical School

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**“WE CONTINUE TO EXPAND OUR CAPABILITY TO TREAT NEUROLOGICAL DISEASE WITH LASER-LIKE PRECISION THROUGH ADVANCED TECHNOLOGY, THE ADDITION OF NATIONALLY AND INTERNATIONALLY RECOGNIZED FACULTY WITH SUBSPECIALTY SKILLS AND NEW PARTNERSHIPS THAT REFINE THE WAY WE DELIVER CARE.”**

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# NOVEL MINIMALLY INVASIVE ENDOSCOPIC APPROACHES *to the* TREATMENT of PEDIATRIC BRAIN TUMORS



**DAVID SANDBERG, M.D., F.A.A.N.S.,  
F.A.C.S., F.A.A.P.**  
Director, Pediatric Neurosurgery,  
Mischer Neuroscience Institute  
Associate Professor, Departments of  
Neurosurgery and Pediatric Surgery  
UTHealth Medical School

**A 4-year-old boy presents with visual impairment.**

**Diagnosis:** A large benign pilocytic astrocytoma compressing the optic chiasm.

**Treatment:** Endoscopic tumor biopsy and septostomy to treat hydrocephalus, craniotomy for tumor resection after biopsy results.

**Outcome:** No further treatment required with more than four years of follow-up.

**A 16-year-old girl presents with partial cranial nerve VII palsy, with a slightly uneven smile and gait issues.**

**Diagnosis:** Neurocytoma and hydrocephalus.

**Treatment:** Endoscopic biopsy and simultaneous third ventriculostomy.

**Outcome:** No further treatment required with more than four years of follow-up.

**An 8-year-old boy presents with headaches.**

**Diagnosis:** Choroid plexus papilloma in the third ventricle blocking fluid circulation.

**Treatment:** Endoscopic gross tumor resection.

**Outcome:** Cure.

**P**ediatric brain tumors are the second most common cancer in children. Approximately 4,000 brain tumors are diagnosed in children in the United States each year. The etiology is unknown, and for reasons that are not understood, the incidence is rising. To improve the odds for patients with childhood brain tumors, the Mischer Neuroscience Institute (MNI) at Memorial Hermann-Texas Medical Center and UTHealth Medical School have joined forces with The University of Texas MD Anderson Cancer Center to establish a unique combined Pediatric Brain Tumor Program.

Minimally invasive endoscopic techniques to treat brain tumors and hydrocephalus enable treatment of some brain tumors through very small incisions with minimal hair shaving. To avoid the complications of ventriculoperitoneal shunting for children with hydrocephalus, pediatric neurosurgeons affiliated with the program perform endoscopic techniques such as third ventriculostomy, septostomy, choroid plexus coagulation and fenestration of arachnoid cysts. In collaboration with otorhinolaryngologists at Memorial Hermann-Texas Medical Center, they also remove some tumors using endoscopic transnasal approaches without an external incision. In older children, awake craniotomies may be performed when advanced mapping techniques are used to preserve

**“THROUGH THE COLLABORATION OF CHILDREN’S MEMORIAL  
HERMANN HOSPITAL AND MD ANDERSON CANCER CENTER, WE’RE  
ABLE TO OFFER A COMPREHENSIVE, PERSONALIZED APPROACH TO  
SURGERY, RADIATION THERAPY AND CHEMOTHERAPY.”**

“Our collaboration with MD Anderson is good news for children and adolescents with brain tumors,” says David I. Sandberg, M.D., F.A.A.N.S., F.A.C.S., F.A.A.P., director of pediatric neurosurgery at MNI, who holds joint appointments as associate professor in the Vivian L. Smith Department of Neurosurgery and the department of Pediatric Neurosurgery at the UTHealth Medical School, and is also an associate professor in the department of Neurosurgery at the MD Anderson Cancer Center. “Using novel approaches to surgery and chemotherapy, we have the potential to minimize side effects from treatment and achieve better long-term survival rates.”

eloquent areas of the brain, such as those that control language function.

“Pediatric brain tumors are a diverse group of diseases that together constitute the most common solid tumor of childhood,” Dr. Sandberg says. “Like other malignant tumors, they’re classified according to histology, and tumor location and extent of spread are important factors that affect treatment and prognosis.”

Tumors present in a variety of ways depending on their location in the brain. “The most common presentation is signs and symptoms of elevated intracranial pressure, especially headache and vomiting,” Dr. Sandberg says. “In infants

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[CHILDRENS.MEMORIALHERMANN.ORG/NEUROSURGERY](http://CHILDRENS.MEMORIALHERMANN.ORG/NEUROSURGERY)

and young children, irritability or a fontanelle that is fuller than normal may be signs of elevated intracranial pressure.” Other presenting signs and symptoms of brain tumor in children may include motor weakness, sensory changes, personality changes, unsteady gait, difficulty with muscle control, seizures, endocrine disorders, lethargy, visual changes and speech problems.

“Through the collaboration of Children’s Memorial Hermann Hospital and MD Anderson Cancer Center, we’re able to offer a comprehensive, personalized approach to surgery, radiation therapy and chemotherapy,” he says. “Subspecialists from pediatric neuro-oncology, pediatric neurosurgery, radiation oncology and neuroradiology discuss every child’s case in a joint tumor board.”

Minimally invasive endoscopic surgery is used when possible, and the MD Anderson Proton Therapy Center offers the most advanced radiation therapy available to treat cancers of the brain and spine in children. The hospital’s cancer specialists, who are international cancer experts and leaders in the research and treatment of cancer, pioneered the innovative, extremely precise form of proton therapy known as pencil-beam scanning. The technique targets the tumor while avoiding healthy tissue – especially important in a developing child.

Prior to his arrival in Houston in 2012, Dr. Sandberg conducted translational studies that demonstrated the safety of infusing chemotherapeutic agents directly into the fourth ventricle to treat children with malignant brain tumors in this location. The promising results of those studies have led to a pilot clinical trial available only at Children’s Memorial Hermann Hospital and the MD Anderson Cancer Center for children with recurrent tumors in this area of the brain. “This radically new approach to chemotherapy allows us to circumvent the blood-brain barrier and deliver agents directly to the



site of disease while minimizing side effects by decreasing systemic drug exposure,” Dr. Sandberg says. “Other novel approaches being investigated by our combined research team include administration of natural killer cells into the fourth ventricle to attack tumor cells via cell-directed therapy.” Numerous additional chemotherapy trials are available for patients, including trials sponsored by the Children’s Oncology Group, a National Cancer Institute-supported clinical trials group that partners with research scientists from around the

**Using novel approaches, Dr. David Sandberg and his team are minimizing chemotherapy side effects and achieving better long-term brain cancer survival rates.**

world to understand the causes of cancer and find more effective treatments.

“The courage of our patients and their families inspires us on a daily basis to provide the best care available for pediatric brain tumors,” Dr. Sandberg says. “Through our combined program with MD Anderson, we’re discovering new and better ways to prevent, diagnose and treat childhood brain tumors.”

# SUPRACLAVICULAR BRACHIOPLEXUS LEIOMYOSARCOMA:

A PATIENT BENEFITS FROM A NEUROSURGEON'S EXPERTISE IN SPINAL  
NEUROSURGERY AND RECONSTRUCTIVE PERIPHERAL NERVE SURGERY

**L**eiomyosarcoma is a rare malignant tumor of the smooth muscle cells that can arise almost anywhere in the body, but is most common in the uterus, abdomen or pelvis. The cancer typically spreads through the blood stream to attack the lung, liver, blood vessels and other soft tissues in the body. Leiomyosarcomas can be very unpredictable, remaining dormant for long periods and recurring after many years. The best outcomes occur when tumors can be removed surgically early, with wide margins, while small and in situ.

Hilary Cannon had passed that point by the time she was referred to Daniel H. Kim, M.D., F.A.A.N.S., F.A.C.S., who joined the Mischer Neuroscience Institute at Memorial Hermann-Texas Medical Center from Baylor College of Medicine in October 2012 and holds a concurrent appointment as professor and director of spinal neurosurgery and reconstructive peripheral nerve surgery in the Vivian L. Smith Department of Neurosurgery at UTHealth Medical School. Diagnosed in 2006 with an even rarer type of leiomyosarcoma that originated in her inferior vena cava, Cannon found herself, by the fall of 2012, at the end of known or offered treatments for her particular manifestation of the disease.



**DANIEL H. KIM, M.D., F.A.A.N.S., F.A.C.S.**  
Director, Reconstructive Spinal and  
Peripheral Nerve Surgery,  
Mischer Neuroscience Institute  
Professor, Department of Neurosurgery  
UTHealth Medical School

During the seven years following her diagnosis, metastases had appeared on her scalp, rib cage, interior lungs, liver, lymph nodes, spine and neck. Under the

care of a sarcoma oncologist at a renowned cancer center, the tumors were resected when possible. She underwent radiation therapy twice and endured three courses of aggressive adjuvant chemotherapies. The metastases grew, but with treatment they remained under control.

In June 2012, when a tumor on her spine caused spinal cord compression of 50 percent, her medical team scheduled a resection. The largest remaining tumor was a cosmetically disfiguring left supraclavicular brachioplexus sarcoma that measured between five and seven centimeters - between the size of a golf ball and a baseball.

Scans done every three months revealed that the tumor was growing rapidly. When Cannon began to lose the use of her left arm and suffered significant pain in the upper left chest area, her sarcoma specialist advised her that surgery to remove the sarcoma would put her at high risk for paralysis of the arm or hand, and offered her palliative care.

"I was 45 years old and healthy as a horse except for this little cancer thing," she says, in her characteristic affirmative style. "I volunteer in the community and exercise daily. I live a normal life with my husband and two kids. I'm a creative writer, I travel a great deal and I'm into photography. I'm very active in my Christian faith and church community. Accepting palliative care as my only option was just not reasonable for me."

A suggestion from a friend led her to schedule an appointment with neurosurgeon Richard Harper, M.D., who holds staff appointments at three Texas Medical Center hospitals and faculty appointments in the department of Neurosurgery and department of Surgery at Baylor College of Medicine. It was Dr. Harper who referred her to Dr. Kim, who is nationally and internationally renowned for his expertise in spinal neurosurgery and reconstructive peripheral nerve surgery. A clinical and educational leader in his field, Dr. Kim



is the primary author of 17 textbooks on outpatient spinal procedures and surgeries, minimally invasive endoscopic spinal surgery, percutaneous endoscopic spine surgery, complex spinal reconstruction, spinal motion preservation surgery, spinal tumor surgery, adult and pediatric traumatic spinal injuries, image-guided spinal fusions, peripheral nerve surgery and reconstructive peripheral nerve surgery. An adjunct professor in the department of Bioengineering and Electrical Engineering Computer Science at Rice University, Dr. Kim is renowned for his research in radiographic nerve imaging, minimally invasive spine surgery, endoscopic spinal

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**“HILARY CANNON’S STORY UNIQUELY DESCRIBES MY SUBSPECIALTY. SHE HAD A VERY AGGRESSIVE MALIGNANT TUMOR THAT WAS ENCASED IN INTRICATE NEUROLOGICAL STRUCTURE. OTHERS THOUGHT THE SURGERY WAS TOO TECHNICAL AND HIGH RISK. WE WERE ABLE TO REMOVE IT WITH NO DEFICIT.”**

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surgery, computer modeling of a spinal motion segment and reconstruction of peripheral nerve injuries. He is the recipient of numerous grants from prestigious organizations and agencies, and has coauthored more than 120 peer-reviewed journal articles related to his research and subspecialty practice.

“Dr. Kim put me at ease immediately with his confidence and forthright approach,” Cannon says. “He looked at my most recent scans, saw that the mass was compressing my left brachial plexus and was immediately very confident that he could perform an uncomplicated resection of the tumor with clean margins. After we talked, there was no doubt in my mind that I would move forward with the surgery.”

Dr. Kim accompanied Cannon to the OR on Nov. 1, 2012. “The tumor occupied almost the entire space of the posterior cervical triangle from the apex of the sternocleidomastoid muscle to the trapezius, all the way down to the base of

the clavicle,” he says. “We were able to successfully remove the entire tumor en bloc under the microscope.”

Scheduled for a three-day hospitalization, Cannon was discharged within 24 hours of her admission for surgery. “Dr. Kim performed the procedure with such finesse and so little impact on my body that I recovered the use of my arm quickly,” she says. “There were no staples or external sutures, only internal sutures and Steri-Strips. I healed so quickly that three weeks after the surgery I flew to Albuquerque to spend Thanksgiving with my husband’s family. I have a long, V-shaped scar but he did such a great job following the crease of my neck that you can only see it when I’m wearing a tank top.”

Cannon describes her experience with Dr. Kim as very personally moving. “He had such confidence, and that meant so much to me after the experiences I’d had with other doctors. He explained the risks but told me that during his years of practice he had performed more than 7,000 surgeries including more than 1,000 in the brachial plexus area. For a neurosurgeon, he has an unusual bedside manner. I was impressed by his talent and skill, and touched by his humility. ‘I’m not the one in control,’ he told me. ‘God is.’

“At my follow-up he told me that I have a great attitude and asked me how I keep it up,” she adds. “Many nurses have asked me that question but never a doctor. He was the first.”

He was also the first physician who considered removal of her tumor reasonable. “To have someone of his stature agree with me validated my decision and gave me more confidence in my choice,” she says.

Dr. Kim describes Cannon as “a lovely lady who is beyond positive. Her story uniquely describes my subspecialty. She had a very aggressive malignant tumor that was encased in intricate neurological structure and a very uncertain prognosis. Others thought the surgery was too technical and high risk. We were able to remove it with no deficit.”

# WORLD-CLASS CARE *at the* CHILDREN'S NEUROSCIENCE CENTER

**W**ith the arrival of David Sandberg, M.D., F.A.A.N.S., F.A.C.S., F.A.A.P., in June 2012, the Mischer Neuroscience Institute (MNI) at Memorial Hermann-Texas Medical Center added significant strength to its Children's Neuroscience Center. Dr. Sandberg joined the MNI team as director of pediatric neurosurgery from Miami Children's Hospital and the University of Miami Miller School of Medicine, where he was a voluntary associate professor of clinical neurological surgery and pediatrics. His major clinical interests include pediatric brain tumors, minimally invasive endoscopic approaches to brain tumors and hydrocephalus, congenital spinal anomalies, vascular malformations, spasticity and craniofacial disorders in children. He joins Stephen Fletcher, D.O., a nationally recognized pediatric neurosurgeon with 30 years of experience in treating children with neurosurgical conditions.

"We collaborate with nationally recognized craniofacial plastic surgeons at Children's Memorial Hermann Hospital to perform both conventional and minimally invasive endoscopic surgeries to repair craniosynostosis and other complex craniofacial anomalies," Dr. Sandberg says. "The multidisciplinary Texas Cleft-Craniofacial team has been a regional leader for pediatric craniofacial surgery for decades."

The Mischer Neuroscience Institute is also a center of excellence for pediatric epilepsy surgery and comprehensive specialized care for children with intractable epilepsy. Children's Memorial Hermann Hospital's Pediatric Epilepsy Program, led by Gretchen Von Allmen, M.D., is home to the largest and most comprehensive Epilepsy Monitoring

Unit in the southwestern United States. In addition to MRI and CT with low radiation dose protocols for pediatric patients, epileptologists use noninvasive magnetoencephalography (MEG) to map brain activity to locate the source of epileptic seizures and minimize risk for children undergoing resective surgery for refractory epilepsy. Video EEG, PET, SPECT, memory and speech (Wada) testing and neuropsychological testing aid in achieving accurate diagnosis.

The Children's Neuroscience Center also provides a broad range of diagnostic and treatment services for children with complex neurological problems including autism, brachial plexus disorders, brain tumors and malformations, tethered cord, cerebral palsy, congenital hydrocephalus, craniofacial disorders, developmental disorders, epilepsy, chronic headache and

migraine, head trauma, learning disabilities, mitochondrial disorders, movement disorders, myopathy, neurofibromatosis, neurometabolic disorders, neuromuscular disorders, pediatric stroke, peripheral nerve disorders, sleep disorders, spina bifida, Tourette syndrome and tuberous sclerosis complex. "We also offer specialized pediatric neurosurgical expertise in congenital malformations, including Chiari malformation, endoscopic neurosurgery, and treatment for pediatric stroke, spinal deformities and traumatic brain and spine injury," Dr. Sandberg says.

"We deliver care in a friendly, reassuring environment that promotes wellbeing and the best possible outcomes," he adds. "When surgery is required, we use advanced imaging and minimally invasive procedures that lower patient risk."

**Gretchen Von Allmen, M.D., Robert Knowlton, M.D., and Michael Funke, M.D., utilize magnetoencephalography brain imaging to locate the source of epileptic seizures and minimize risk for children undergoing surgery.**



# NEWS of NOTE

## PEOPLE

### Mischer Neuroscience Institute and UTHealth Medical School Welcome New Recruits

Five physicians and two neuropsychologists have joined the staff of the Mischer Neuroscience Institute (MNI) at Memorial Hermann-Texas Medical Center and UTHealth Medical School.



**DANIEL H. KIM, M.D., F.A.A.N.S., F.A.C.S.**  
Director, Reconstructive Spinal and Peripheral Nerve Surgery, Mischer Neuroscience Institute  
Professor, Department of Neurosurgery  
UTHealth Medical School

Daniel H. Kim, M.D., F.A.A.N.S., F.A.C.S., joins MNI from Baylor College of Medicine and holds a concurrent appointment as professor and director of spinal neurosurgery and reconstructive peripheral neurosurgery in the Vivian L. Smith Department of Neurosurgery at UTHealth Medical School. At Baylor, Dr. Kim held dual appointments as professor and director of spinal neurosurgery and reconstructive peripheral nerve surgery in the department of Neurosurgery and professor in the department of Orthopedic Surgery.

Nationally and internationally renowned for his expertise in spinal neurosurgery and reconstructive peripheral nerve surgery, Dr. Kim is a diplomate of the American Board of Neurological Surgery and a fellow of the American College of Surgeons. He received his medical degree at Tulane University School of Medicine in New Orleans in 1989, followed by residency in neurosurgery at Louisiana State University and a fellowship in complex reconstructive spinal surgery at the University of Florida in Gainesville. He has held faculty appointments at The University of Texas MD Anderson Cancer

Center, Ochsner Clinic Foundation and Stanford University Medical Center.

A clinical and educational leader in his field, Dr. Kim is the primary author of 17 textbooks on outpatient spinal procedures and surgeries, minimally invasive endoscopic spinal surgery, percutaneous endoscopic spine surgery, complex spinal reconstruction, spinal motion preservation surgery, spinal tumor surgery, adult and pediatric traumatic spinal injuries, image-guided spinal fusions, peripheral nerve surgery and reconstructive peripheral nerve surgery. An adjunct professor in the department of Bioengineering and Electrical Engineering Computer Science at Rice University, Dr. Kim is renowned for his research in radiographic nerve imaging, minimally invasive spine surgery, endoscopic spinal surgery, computer modeling of a spinal motion segment and reconstruction of peripheral nerve injuries. He is the recipient of numerous grants from prestigious organizations and agencies, and has coauthored more than 120 peer-reviewed journal articles related to his research and subspecialty practice.



**SIGMUND H. HSU, M.D., F.A.A.N.S., F.A.C.S.**  
Neuro-Oncologist  
Assistant Professor,  
Departments of Neurosurgery and Neurology  
UTHealth Medical School

MNI has expanded its neuro-oncology team with the addition of Sigmund H. Hsu, M.D. Dr. Hsu joined MNI from Susquehanna Resources and Environment, Inc., in Binghamton, New York, where, as assistant vice president and chief technology officer, he helped create and patent revolutionary technology to search satellite and aerial imagery. Prior to that, he was an assistant professor in the department of Neuro-Oncology, division of Cancer Medicine at MD Anderson Cancer Center, where he completed a fellowship in neuro-oncology.

Dr. Hsu received his medical degree in 1995 at Brown University in Providence, Rhode Island, and completed a neurology residency at New York Presbyterian

Hospital-New York Weill Cornell Center, where he received his initial neuro-oncology and cancer neurology training at the Memorial Sloan-Kettering Cancer Center. His clinical and research interests include discovery of new and more effective therapies for patients with primary brain tumors, treatment of metastatic cancer to the brain and spinal fluid and the evaluation and treatment of neurological problems in cancer patients. While at MD Anderson, Dr. Hsu was involved in research targeting metabolic pathways of brain tumor growth and was principal investigator of two national clinical trials for patients with glioblastoma and primary CNS lymphoma. He was also a National Institutes of Health-funded co-investigator in a novel treatment for metastatic cancer to the spinal fluid, and collaborated with the department of Investigational Cancer Therapeutics to evaluate and treat neurological disease in cancer patients in dose-escalating experimental drug trials.

The coauthor of numerous abstracts, articles in peer-reviewed journals and book chapters, he is board certified in neurology by the American Board of Psychiatry and Neurology. Dr. Hsu is an assistant professor of neurosurgery at UTHealth Medical School.



**JACK N. ALPERT, M.D., F.A.A.N.**  
Clinical Assistant Professor,  
Department of Neurology  
UTHealth Medical School

A senior neurologist in private practice in Houston for more than 30 years, Jack N. Alpert, M.D., F.A.A.N., joined the Mischer Neuroscience Institute team in March. An outstanding educator with expertise in the diagnosis of all types of neurological disease, he holds a faculty appointment at the UTHealth Medical School as professor in the department of Neurology.

Dr. Alpert received his medical degree at Tufts University School of Medicine in Boston, and completed his neurology residency at Mount Sinai Hospital in New York City. He served as a neurologist in

the United States Air Force from 1968 to 1970, and was chief of the department of Neurology at St. Luke's Episcopal Hospital in Houston from 1986 to 2008.

Dr. Alpert has been named by his peers among the Best Doctors in America® every year since 1999, and has been listed among *Texas Monthly* magazine's Texas Super Doctors since 2004. He is a life member of *Who's Who in America* since 1999.

He is the author of a textbook, *The Neurological Diagnosis: A Practical Bedside Approach*, published in 2011, and has coauthored numerous peer-reviewed articles and abstracts in *Neurology*, *Experimental Neurology*, *Journal of the Neurological Sciences*, *Archives of Neurology* and *Neuro-ophthalmology*, among other journals. His clinical and research interests include neuro-otology, eye movement disorders and neurology education.



**JOSEPH HSIEH, M.D.**  
Assistant Professor,  
Department of Neurology  
UTHealth Medical School

Joseph Hsieh, M.D., an assistant professor in the Vivian L. Smith Department of Neurosurgery, is a fellowship-trained, board-eligible neurosurgeon with expertise in neurosurgical treatment of disorders of the spinal column and cord. He specializes in complex spinal reconstruction as well as minimally invasive approaches.

A graduate of Stanford University with a master's in biology, Dr. Hsieh holds an M.B.A. and M.P.H. from the Anderson School of Management and the School of Public Health at the University of California, Los Angeles. He received his medical degree at Harvard Medical School. Prior to joining Mischer Neuroscience Associates, Dr. Hsieh completed his residency in neurosurgery at the University of Chicago and a complex spine fellowship at Cedars-Sinai Medical Center in Los Angeles.

Dr. Hsieh has presented his work on policy in neurosurgery and spine both

nationally and internationally, and continues research on quality initiated during time he spent in Washington, D.C., as the Plante Public Policy fellow for the Congress of Neurological Surgeons. His clinical interests include deformity, disc herniation, fracture, infection, myelopathy, radiculopathy, spinal arteriovenous malformations, spinal stenosis, spondylolisthesis, spondylosis and tumor.



**G. SILKY PATEL, M.D.**  
Clinical Assistant Professor,  
Department of Neurology  
UTHealth Medical School

Fellowship trained and board certified in physical medicine and rehabilitation, G. Silky Patel, M.D., specializes in interventional spine, musculoskeletal and electrodiagnostic medicine. Her primary focus is on nonsurgical musculoskeletal and spine care, including physical therapy, injections and electrodiagnosis of nerve and muscle conditions that cause pain, numbness, tingling or weakness.

Dr. Patel received her medical degree from The University of Texas Medical Branch at Galveston (UTMB), where she also completed her internship training. She completed her internship training at UTHealth Medical School. After completing her physical medicine and rehabilitation residency at Loyola University Medical Center in Chicago, she completed a fellowship in pain management at Loma Linda University Medical Center in Loma Linda, California.

Prior to joining MNI, Dr. Patel was affiliated with the Rehabilitation Specialists of Chicago group, where she focused on inpatient rehabilitation. An assistant professor in the department of Neurosurgery at UTHealth Medical School, she has presented research at numerous national conferences and is the coauthor of articles published in the *American Journal of Physical Medicine and Rehabilitation* and *Free Radical Biology and Medicine*. Dr. Patel's current research is focused on subcutaneous and peripheral nerve

stimulation for the treatment of Horton's neuralgia and chronic paroxysmal hemi-craniias, and kyphoplasty for treating vertebral compression fracture. Her clinical interests include cervical and lumbar radiculopathy; joint viscosupplementation; complex regional pain syndrome; electromyography; epidural injections; facet joint, sacroiliac joint and back pain; radiofrequency ablation; spinal cord stimulation; and nerve conduction studies.



**JACQUELINE PHILLIPS-SABOL, PH.D., A.B.P.P.-C.N.**  
Director, Neuropsychology Program  
Mischer Neuroscience Institute  
Assistant Professor, Department of Neurology  
UTHealth Medical School

Jacqueline Phillips-Sabol, Ph.D., A.B.P.P.-C.N., joins MNI as director of the Neuropsychology Program with a concurrent appointment as assistant professor in the department of Neurology at UTHealth Medical School. Since her arrival in August 2012, she has established a new hospital-based Neuropsychology Program within the department of Neurology. The program provides neurocognitive assessment of patients referred for memory decline and other cognitive issues.

Dr. Phillips-Sabol received her doctorate in counseling psychology from Gannon University in Erie, Pennsylvania, followed by a two-year postdoctoral neuropsychology fellowship in the department of Neurology at the University of Alabama at Birmingham Medical Center. From 2008 to 2012, she was the developer and director of the division of Neuropsychology at Scott and White Hospital in Temple, Texas. In addition, she was an assistant professor of surgery and neuropsychology training director over the neuropsychology fellowship program at Texas A&M Health Science Center College of Medicine. Additional prior professional experience includes adult/geriatric neuropsychology positions at Indiana Neuroscience Institute at St. Vincent Hospital in Indianapolis, and at Carle Neurology Clinic in Urbana,

Illinois. From 1992 to 2003 she was in private practice.

Dr. Phillips-Sabol is board certified by the American Board of Professional Psychology-Clinical Neuropsychology. She is the national chair of the American Academy of Clinical Neuropsychology's Outcomes Consortium. Her research interests include cognitive issues in movement disorders, the use of functional MRI to enhance presurgical planning, functional connectivity measures in the evaluation of surgical risk and neuropsychological outcomes research. A member of the American Association of Clinical Neuropsychology, American Psychological Association, National Academy of Neuropsychology and the International Neuropsychological Society, she is a sought-after speaker who has made numerous invited presentations.



**BETHANY R. WILLIAMS, PH.D.**  
Assistant Professor,  
Department of Neuropsychology  
UTHealth Medical School

Bethany R. Williams, Ph.D., comes to MNI from the Scott & White Memorial Hospital, where she completed a postdoctoral fellowship in neuropsychology under the direction of Dr. Phillips-Sabol. She received her doctorate in clinical psychology at the State University of New York at Binghamton, followed by an internship in clinical psychology at the University of Arizona College of Medicine in Tucson.

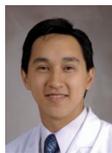
An assistant professor in the department of Neurology at UTHealth Medical School, Dr. Williams conducts comprehensive neuropsychological evaluations of clinical neurodegenerative and acquired brain disorders, with specialized training in movement disorders and dementias. Her clinical interests include Parkinson's disease, atypical Parkinsonian disorders, mild cognitive impairment and dementias, traumatic brain injuries, stroke and epilepsy. Her research interests focus on normal aging, cognitive dysfunction and dementias.

Recognized with numerous awards, she has coauthored articles that have appeared in *Current Pediatric Reviews* and *The Clinical Neuropsychologist*. She is a member of the American Psychological Association and the International Neuropsychological Society.

## CLINICAL OUTREACH

### Stroke Team Reduces Door-to-Needle Time

With the implementation of new processes, the Mischer Neuroscience Institute Stroke Team has reduced the median door-to-needle (DTN) time for delivery of intravenous tissue plasminogen activator (tPA) by 15 minutes at Memorial Herman-Texas Medical Center. Data from the quality improvement project were presented by members of the team at the 8<sup>th</sup> World Stroke Congress, held in October in Brasilia, Brazil.



**CLAUDE NGUYEN, M.D.**  
Senior Vascular Neurology Fellow,  
Department of Neurology  
UTHealth Medical School

"We all know that the benefit of intravenous tPA in acute ischemic stroke patients is greatest when given early," says Claude Nguyen, M.D., a second-year stroke fellow at UTHealth Medical School who led the quality improvement project. "Guidelines for hospitals in the United States recommend treatment within 60 minutes of arrival in the emergency department. In late 2011, we began to see increasing door-to-needle times without any obvious explanation, and we set out to identify the causes and implement new processes to expedite treatment."

A committee of physicians, nurses and administrative and ancillary staff from the Emergency department, neurology service and radiology reviewed times for patients treated with tPA based on data retrospectively collected from standardized time points in the hospital's

electronic medical record. They then compared them with prospective data collected by the treating physician.

"Using the Total Quality Improvement method, we created a detailed flow-chart starting from pre-notification by paramedics through thrombolytic administration," Dr. Nguyen says. "Next, we identified steps of the process that could be improved and implemented changes designed to decrease time."

The review of process impediments revealed some surprises involving technologies implemented to promote patient safety and operational efficiency. "We found discrepancies between patient arrival times documented in the electronic medical record compared to those recorded by the treating physician, which were caused by a new computer system designed to assist patient triage," he says. "Other sources of delay included the complexity of the communication plan used to alert stroke neurologists, triaging between multiple CT scanners and obtaining medication from a computerized system designed to improve patient safety."

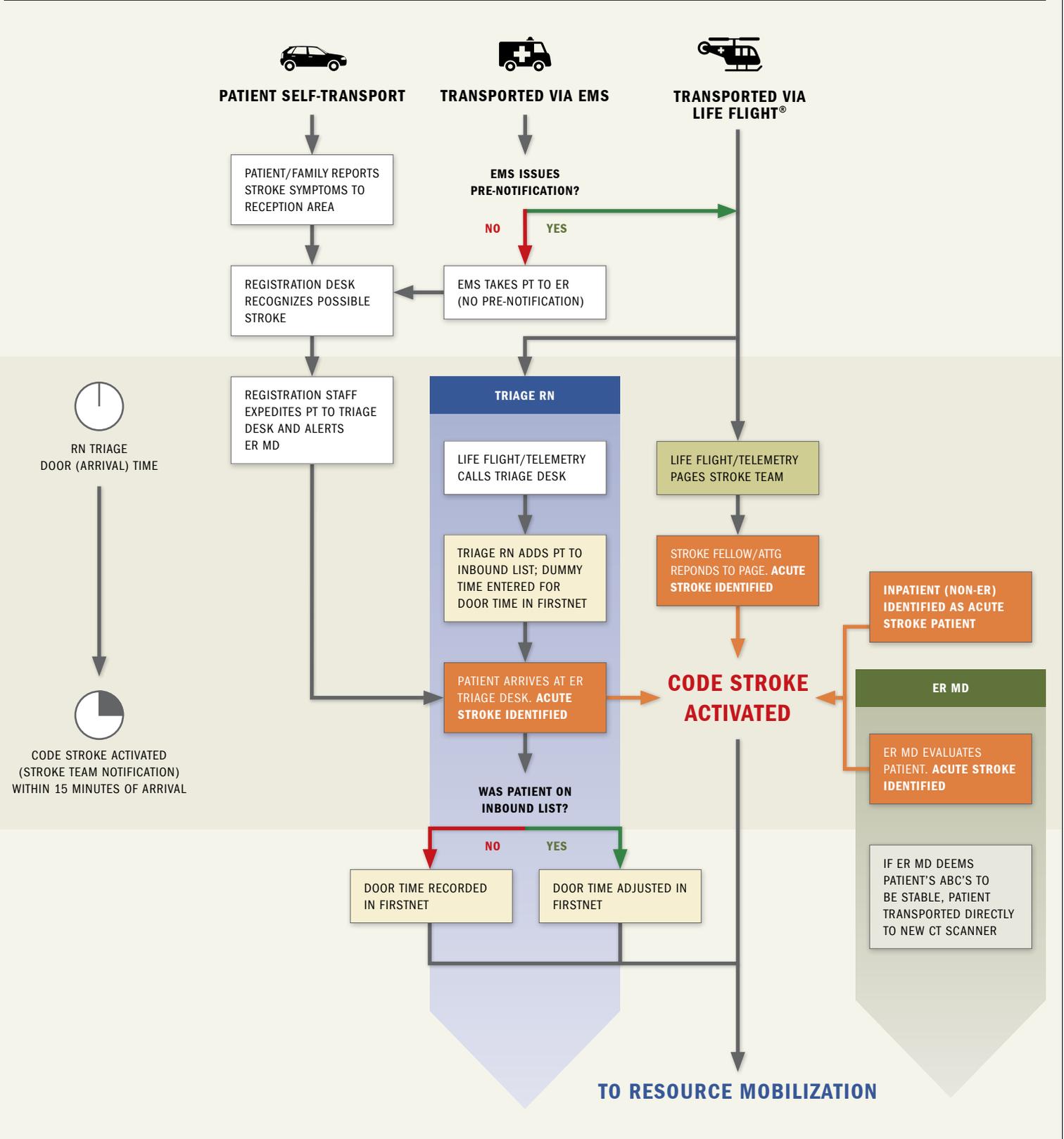
A new paging plan reduced the amount of redundancy in cross-communication, and CT technicians were added to the paging pathway to help triage acute stroke patients to an available scanner quickly. Access to the computerized medication system was extended to include research nurses, and tPA was made more widely available during CT scanning.

"Our project highlights the importance of regular review of treatment processes to ensure that we operate as a well-oiled machine, especially in the face of technology changes and patient volume increases," Dr. Nguyen says. "On average, only about 5 percent of patients with ischemic stroke arrive at the hospital early enough to be treated with tPA, but we've found that we're treating about 25 percent of patients with symptoms within three hours. Despite our high volumes, our complication rate is low when compared to the literature, and we've

# MNI STROKE CENTER: DOOR-TO-NEEDLE FLOWCHART

## Acute Cerebrovascular Symptoms with Onset < 12 Hours of:

- Altered mental status w/o trauma
- Headache
- Vision loss/changes
- Hearing loss
- Facial weakness
- Aphasia or dysarthria
- Unilateral weakness
- Dizziness
- Ataxia



been able to safely produce a decrease in mortality associated with ischemic stroke over the last two years. With our lower door-to-needle times, we'll be able to treat an even higher percentage of patients safely."

### Mischer Neuroscience Institute's Stroke Program Receives Joint Commission Advanced Certification as a Comprehensive Stroke Center



American Heart Association  
American Stroke Association  
**CERTIFICATION**  
Meets standards for  
Comprehensive Stroke Center

The Joint Commission and the American Heart Association/American Stroke Association have awarded the Mischer Neuroscience Institute (MNI) the highly coveted Comprehensive Stroke Center certification. MNI is the first and only stroke program in the state of Texas to meet The Joint Commission's rigorous standards, solidifying its position among an elite group of providers focused on complex stroke care.

Comprehensive Stroke Center certification recognizes hospitals with the infrastructure, staff and training to receive and treat patients with highly complex strokes. MNI underwent a rigorous onsite review earlier this year to ensure compliance with TJC's stringent requirements, which include advanced imaging capabilities, 24/7 availability of specialized treatment, and staff with the education and competencies to care for complex stroke patients.

"By achieving this advanced certification, the Mischer Neuroscience Institute has thoroughly demonstrated the highest level of commitment to the care of its patients with complex stroke conditions," says Mark R. Chassin, M.D., president of The Joint Commission. "Certification is a voluntary process and The Joint Commission commends MNI for successfully undertaking the challenge to elevate the standard of care for the community it serves."

Comprehensive Stroke Center certification is many steps above The Joint Commission's Primary Stroke Center certification. "To achieve this certification, we met very particular and exacting requirements," says James Grotta, M.D., director of MNI's Neurology Program and Chair of the Department of Neurology at UTHealth Medical School. "Only 40 centers across the country have achieved this goal and none other in Texas."

Close collaboration among stroke team members led by Sean Savitz, M.D., director of the Stroke Program, was critical to achieving advanced certification. "This certification speaks to the excellence of our stroke program and also to the incredible teamwork of everyone at MNI, from our affiliated neurosurgeons and neurologists to our dedicated nurses and physical therapists and everyone in between," says Amanda Spielman, system executive for neurosciences at the Memorial Hermann Health System. "Our ability to collaborate successfully to implement significant improvements to a stroke program that was already leading the way is what sets us apart from other centers."

"Collecting the data we needed for Comprehensive Stroke Center certification allowed us to see evidence-based opportunities to make our stroke care even better," says Nicole Harrison, R.N., administrative director of MNI. "We made significant improvements in our peer-review process, and we also implemented a cognitive screening and depression screening process for every patient prior to discharge and post discharge."

A stroke leadership committee comprised of physicians and other caregivers from key departments at Memorial Hermann-Texas Medical Center was formed to guide the processes necessary to achieve the certification. The group held weekly meetings for six months to ensure that all standards of practice and protocols were integrated across every discipline.

"Education is an integral piece of this certification, and we're already seeing the benefits for our patients," Harrison

says. "We have the infrastructure in place to sustain the two-year certification into the future and to continue to improve."

To ensure that the Stroke Program had the necessary support to achieve Comprehensive Stroke Center certification, new team members were added, including additional stroke coordinators, data extractors and advanced nurse practitioners. Harrison credits Memorial Hermann-TMC administration with ensuring MNI's success throughout the certification process.

"Our administrative leadership team was crucial in securing the resources we needed to make this certification happen," she says. "Without that support, we couldn't have achieved this milestone."

## EVENTS

### Mischer Neuroscience Institute Hosts 6<sup>th</sup> Annual Yatsu Day Symposium on Stroke

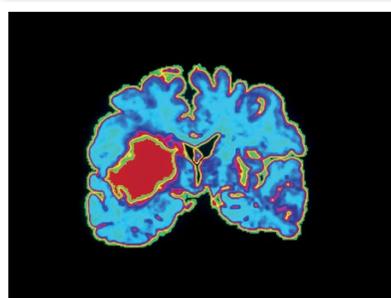


More than 100 physicians, nurses and physician assistants working in neurology, neurosurgery, cardiology, hematology, family practice, internal medicine and emergency medicine attended the 6<sup>th</sup> Annual Yatsu Day Symposium on Innovations in Stroke Prevention, held October 26 at Memorial Hermann-Texas Medical Center. This year's CME event was focused on identifying and evaluating the biological processes that lead to stroke, evaluating new approaches to imaging atherothrombosis in stroke and evaluating the effectiveness of new medical, surgical and endovascular approaches to preventing the disease.

Keynote speakers were Pierre Amarenco, M.D., professor and chair,

department of Neurology and Stroke Centre, Bichat University Hospital, Paris, France, who presented Neurology Grand Rounds on Lipid Modifying Agents and Neuroprotection; Christie Ballantyne, M.D., professor of medicine, chief of cardiology and cardiovascular research and director of the Center for Cardiovascular Disease Prevention at Baylor College of Medicine and Methodist DeBakey Heart Center-Houston, who spoke on How to Manage Lipids for Stroke Prevention; Bruce Coull, M.D., professor of neurology, vice dean and associate dean for clinical affairs at the University of Arizona College of Medicine-Tucson, who shared New Insights on Clot Formation; and Marc Fisher, M.D., professor of neurology and radiology and vice chair of the department of Neurology at UMass Memorial Medical Center-Worcester and the University of Massachusetts Medical School-Worcester, who discussed New Anticoagulants for Stroke.

The annual event is held in memory of Frank Yatsu, M.D., who joined UTHealth Medical School in 1982 as the second chair of the department of Neurology. After stepping down as chairman in 1995, he continued his clinical and research activities while at the same time turning his attention to global stroke issues. In 2004, he served as the director of the Global Stroke Initiative, a joint enterprise of the



Welcome to the 6th Annual  
**Yatsu Day Symposium**

Innovations in Stroke Prevention

Memorial Hermann-Texas Medical Center  
Hermann Pavilion Conference Center

7:30 - 8 a.m. Registration and Continental Breakfast  
8 a.m. - 5 p.m. Conference



World Stroke Organization and the World Health Organization.

Dr. Yatsu is widely recognized as a pioneer of the modern era of cerebrovascular disease. The annual Yatsu Day Symposium, sponsored by Mischer Neuroscience Institute and UTHealth Medical School each fall, was established in 2006 in his honor.

**SAVE THE DATE**

**Yatsu Day Symposium**

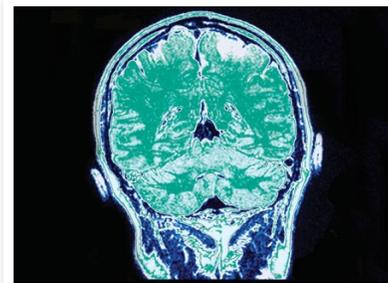
**November 8, 2013**

[neuro.memorialhermann.org/cme/](http://neuro.memorialhermann.org/cme/)

**Mischer Neuroscience Institute Hosts First Annual Neuro ICU Symposium**

The first annual Neuro ICU Symposium was held March 6-8, 2013, at The University of Texas Cooley Conference Center in the Texas Medical Center. More than 350 physicians, nurses and physician assistants working in neurology, neurosurgery, critical care, trauma, emergency medicine and anesthesiology attended this year's event, "Cutting-edge Management of Neurological and Neurosurgical Emergencies and Critical Care." The conference was focused on current hot topics in neurological and neurosurgical emergencies, treatment of multiple end organ system failures in patients with acute brain injuries and development of appropriate strategies for incorporating evidence-based protocols into clinical management through the use of case-based learning and real-life emergencies.

A multidisciplinary team of experts in the field of neurocritical care, neurology, neurosurgery, trauma and nursing, including physicians affiliated with Mischer Neuroscience Institute, presented the course. The keynote address, "The First 60 Minutes: Surgery and Critical Care," was delivered by E. Sander Connolly, M.D., Bennett M. Stein Professor and vice chair in



**The First Annual Neuro ICU Symposium**

Cutting-edge Management of Neurological and Neurosurgical Emergencies and Critical Care

**March 6-8, 2013**

The University of Texas Cooley Conference Center  
7500 Cambridge Street, Houston, Texas

Registration Fees:  
Physicians: \$275 for full course (\$100/day for daily registration)  
RN, PA, NP: \$100 for full course (\$50/day for daily registration)  
Industry, Hospital Administration: \$500 for full course (\$200/day for daily registration)  
Medical Students, Residents, Fellows-in-Training: FREE

To register or for more information, visit [www.Ufcmc.net](http://www.Ufcmc.net)



the department of Neurosurgery at Columbia University College of Physicians and Surgeons in New York City, who also spoke on "Hemodynamic and Multimodality Monitoring: The Importance of Neurological Critical Care in Brain Injury." Other invited guest speakers were Derek Chong, M.D., assistant professor in the department of Neurology at New York University School of Medicine in New York City; and Jose I. Suarez, M.D., professor of neurology and head of section, Vascular Neurology and Neurocritical Care at Baylor College of Medicine in Houston. Dr. Chong spoke on "Status Epilepticus and Other Neuro Emergencies," "Management of Seizure Disorders and Refractory Status Epilepticus" and "Meningitis and Encephalitis: A Tough Enemy But Treatable." Dr. Suarez delivered a special lecture on "Research Priorities and Network in Neurological Care."

Course director was Kiwon Lee, M.D., F.A.C.P., F.A.H.A., F.C.C.M., associate professor and vice chair of the department

**SAVE THE DATE**

**Neuro ICU Symposium**

**March 5-7, 2014**

[neuro.memorialhermann.org/cme/](http://neuro.memorialhermann.org/cme/)

of Neurology at UTHealth Medical School, director of Mischer Neuroscience Associates Neurology, and director of neurocritical care at the Mischer Neuroscience Institute at Memorial Hermann-Texas Medical Center.

### Vivian L. Smith Department of Neurosurgery Hosts Visiting Professors

Seven nationally recognized physician leaders have been invited to give Neurosurgery Grand Rounds at the Mischer Neuroscience Institute at Memorial Hermann-Texas Medical Center during the current academic year.

They are M. Sean Grady, M.D., Charles Harrison Frazier Professor of Neurosurgery and chair of the department of Neurosurgery, Perelman School of Medicine at the University of Pennsylvania (August 2); Robert

**Steven Giannotta, M.D., from the department of Neurosurgery at the University of Southern California was one of several nationally recognized physician leaders invited to give Neurosurgery Grand Rounds at MNI during the academic year.**

Harbaugh, M.D., F.A.C.S., F.A.H.A., University Distinguished Professor, chair of the department of Neurosurgery and director of the Penn State Institute of the Neurosciences at Penn State Hershey; Joel MacDonald, M.D., associate professor of neurosurgery at the University of Utah School of Medicine (October 26); Ralph Dacey, M.D., professor and chair of the Washington University School of Medicine in St. Louis (January 23); Roberto Heros, M.D., professor and co-chair of the department of Neurological Surgery and residency program coordinator at the University of Miami Miller School of Medicine (February 21); Steven Giannotta, M.D., professor and chair, department of Neurosurgery at the University of Southern California (March 21); and Gregory Zipfel, M.D., associate professor, department of Neurological Surgery and associate professor in the department of Neurology at Washington University School of Medicine in St. Louis (May 16).

Grand Rounds conferences are held on Thursdays from 8 to 9 a.m. at the UTHealth Medical School.

## ACCOLADES

### James Grotta, M.D., Principal Investigator in Top 9 NEJM Paper



**JAMES C. GROTTA, M.D.**

Co-director, Mischer Neuroscience Institute  
Professor and Chair, Department of Neurology  
UTHealth Medical School

The 1995 paper announcing results of the first major trial showing the benefits of the then-new clot-busting drug tPA as a treatment for stroke has been voted one of the top nine papers in the 200-year history of the *New England Journal of Medicine*. James C. Grotta, M.D., chair of the department of Neurology and the Roy M. and Phyllis Gough Huffington Distinguished Professor of Neurology at UTHealth Medical School, was principal investigator in Houston, one of six clinical sites that enrolled patients in the trial. The groundbreaking research took place at Memorial Hermann-Texas Medical Center.

The paper, “Tissue Plasminogen Activator for Acute Ischemic Stroke,” published in the Dec. 14, 1995, issue, revealed the first promising treatment for stroke and ultimately changed the way neurologists manage the disease. Administered within three hours of the onset of symptoms, tPA can reduce the effects of stroke and permanent disability.

“At the time we were doing this study, there was no existing treatment for stroke patients,” says Dr. Grotta, who is co-director of Mischer Neuroscience Institute, a collaboration between Memorial Hermann-TMC and the UTHealth Medical School. “I think we were aware of the potential significance of our research for a number of reasons. The treatment we were testing and the timeframe for administering it were far more aggressive than anything done before. And we had a great group of gung-ho investigators



and leadership. But given past disappointments, it was still a surprise when we first saw the positive results. Once we saw the results, we knew it was important and would have a big impact.” Dr. Grotta was quoted in a *New York Times* article announcing the research results, saying, “Until today, stroke was an untreatable disease.”

Barbara Tilley, Ph.D., director of the division of Biostatistics and Lorne C. Bain Distinguished Professor at The University of Texas School of Public Health, part of UTHealth, was principal investigator for the Coordinating Center for the National Institute of Neurological Disorders and Stroke tPA Stroke Study Group. At the time of the study, she was on the faculty at Henry Ford Health Sciences Center in Detroit and helped design, manage and analyze data for the trial. “It’s still the only treatment to date shown to be effective in reducing the effects of stroke for those who have stroke caused by a blood clot in the brain,” Tilley says. “The longer the time to treatment in stroke cases, the lower the effect of the treatment.”

UTHealth researchers continue to push the boundaries of stroke treatment. “The battle to reduce the effects of stroke is won or lost in the first hour after the onset of symptoms,” Dr. Grotta says. “We continue to develop new treatments that build on tPA and new systems to get these treatments to patients faster. The other revolution in stroke treatment is learning how to stimulate the brain’s intrinsic recovery process.”

That revolutionary work includes research led by Sean I. Savitz, M.D., professor of neurology, director of the Stroke Program and director of the Vascular Neurology Program at UTHealth Medical School, whose team is testing stem cell therapies to see if they can assist the brain in recovering from stroke.

In addition to voting the article among the top nine stories, readers also selected the paper as the most important study published in the journal in the 1990s.

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### Ten Physicians Affiliated with MNI Named to U.S. News Top Doctors List

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Three neurosurgeons, four neurologists and three pediatric neurologists affiliated with the Mischer Neuroscience Institute (MNI) at Memorial Hermann-Texas Medical Center have been recognized among the *U.S. News and World Report* Top Doctors for 2012. Physicians named to the list are selected based on a peer nomination process that complements the longstanding medical tradition of seeking physician recommendations from trusted colleagues.

Neurosurgeons named to the list are Dong H. Kim, M.D., director of MNI, chief of neurosurgery at Memorial Hermann-TMC and professor and chair of the Vivian L. Smith Department of Neurosurgery at UTHealth Medical School; Daniel H. Kim, M.D., F.A.C.S., director of reconstructive spinal and peripheral nerve surgery at MNI and professor of neurosurgery at the Medical School; and David I. Sandberg, M.D., F.A.A.N.S., F.A.C.S., F.A.A.P., director of pediatric neurosurgery at MNI, associate professor in the departments of Neurosurgery and Pediatric Surgery at the Medical School, and associate professor of neurosurgery at The University of Texas MD Anderson Cancer Center.

MNI-affiliated neurologists recognized among the nation’s best are James Ferrendelli, M.D., professor in the department of Neurology at UTHealth Medical School; James C. Grotta, M.D., co-director of MNI, chief of neurology and director of the Stroke Center at Memorial Hermann-TMC, Roy M. and Phyllis Gough Huffington Distinguished Chair in Neurology and professor and chair of the department of Neurology at the Medical School; Kazim Sheikh, M.D., professor of neurology and director of the Neuromuscular Program at the Medical School; and Jerry S. Wolinsky, M.D., Bartels Family and Opal C. Rankin Professor in the department

of Neurology, director of the Multiple Sclerosis Research Group and director of the Magnetic Resonance Imaging Analysis Center at the Medical School.

Pediatric neurologists included on the list are Ian Butler, M.D., professor and director of the division of Child & Adolescent Neurology in the department of Pediatric Surgery; Pauline Filipek, M.D., professor in the department of Pediatrics and the Children’s Learning Institute; and Pedro Mancias, M.D., associate professor in the division of Child & Adolescent Neurology, all at UTHealth Medical School.

“We are honored to be recognized by our peers for the quality of care we provide our patients and their families every day,” says Dr. Dong Kim.

*U.S. News* determines the physicians who qualify as Top Doctors by teaming up with Castle Connolly, a New York City-based company that has worked for nearly two decades to identify the nation’s top doctors. Castle Connolly bases its selections on nominations submitted by other doctors and reviewed by its physician-led research team.

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## RESEARCH

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### Hypothermia for Patients Requiring Evacuation of Subdural Hematoma

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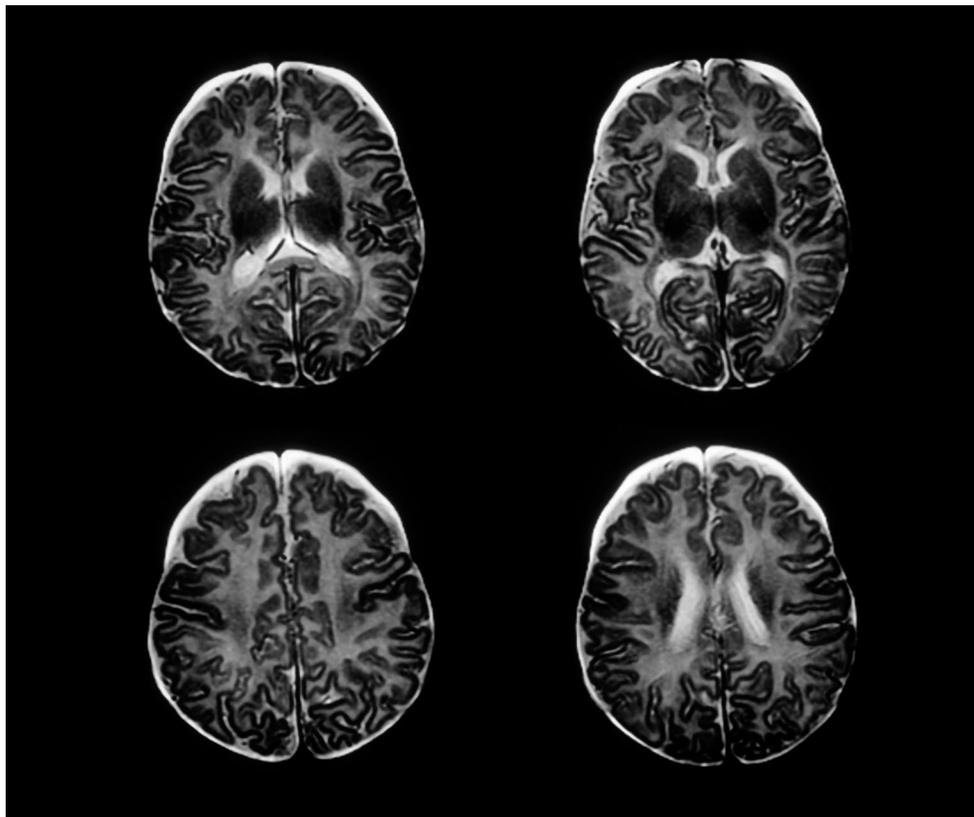
Enrollment is expected to begin this spring in a multicenter randomized, controlled clinical trial designed to test whether hypothermia improves outcomes following traumatic brain injury (TBI) with subdural hematoma requiring evacuation. Funded by the Vivian L. Smith Foundation and Zoll Medical, the HOPES trial (HypOthermia for Patients requiring Evacuation of Subdural Hematoma) will be conducted at three clinical sites: the UTHealth Medical School, the University of Pittsburgh and the University of Miami. To date, no trial to investigate specifically the effect of hypothermia on patients

undergoing surgical evacuation of intracranial hematomas has been conducted.

“While there is presently no cure for traumatic brain injury, there is ongoing research to develop neuroprotective treatments to prevent secondary injury,” says Dong H. Kim, M.D., director of the Mischer Neuroscience Institute at Memorial Hermann-Texas Medical Center and professor and chair of the Vivian L. Smith Department of Neurosurgery at UTHealth Medical School. “In this study, we hypothesize that early induction and maintenance of therapeutic hypothermia before emergent craniotomy for traumatic subdural hematoma will improve global neurologic outcomes.” The primary outcome measure will be a dichotomized Glasgow Outcome Scale-Extended (GOSE) at six months; the investigators define a good outcome as a minimum improvement of 15 percent.

Early hypothermia has been shown to be neuroprotective in ischemia-reperfusion injuries in animal TBI models<sup>1,2</sup>, after cardiac arrest<sup>3-5</sup> and in infants with moderate

**This composite of four axial MRI images shows bilateral subdural hematomas.**



or severe hypoxic-ischemic encephalopathy<sup>6</sup>. While clinical trials have shown that hypothermia can lower intracranial pressure, results of the effect of hypothermia on outcome have been inconclusive, in part because of mixed injury types, initiation and period of cooling, and duration of re-warming.

The HOPES Trial will include a minimum of 120 patients with acute traumatic subdural hematomas who are not following commands and require emergent craniotomy within six hours of injury. Patients who meet the enrollment criteria will be randomized to hypothermia or normothermia immediately following the decision by the attending neurosurgeon to perform emergent craniotomy. Patients randomized to hypothermia will be rapidly cooled to 35 C before removal of the subdural hematoma and maintained at 33 C  $\pm$  0.5 C for a minimum of 48 hours. Patients randomized to standard care will undergo normothermia at 37 C. All patients will have an intravascular temperature management catheter inserted into a femoral vein.

Because of the nature of their injuries, subjects enrolled in the study will require

emergent treatment, often before family members are available to provide consent. To develop evidence for best practice, the law allows research meeting specific criteria to be performed under an emergency waiver of informed consent. Researchers anticipate that patients in the trial will be enrolled under this waiver and that consent will be obtained as soon as possible.

Principal investigators at the study site are Dr. Kim and Georgene Hergenroeder, R.N., assistant professor and study director in the Vivian L. Smith Department of Neurosurgery at the UTHealth Medical School. For more information about the clinical trial, contact Hergenroeder at [georgene.w.hergenroeder@uth.tmc.edu](mailto:georgene.w.hergenroeder@uth.tmc.edu).

<sup>1</sup> Dixon CE, Markgraf CG, Angileri F, Pike BR, Wolfson B, Newcomb JK, et al. Protective effects of moderate hypothermia on behavioral deficits but not necrotic cavitation following cortical impact injury in the rat. *Journal of Neurotrauma*, 1998 Feb;15(2):95-103.

<sup>2</sup> Markgraf CG, Clifton GL, Moody MR. Treatment window for hypothermia in brain injury. *Journal of Neurosurgery* 2001 Dec;95(6):979-83.

<sup>3</sup> Mild therapeutic hypothermia to improve the neurological outcome after cardiac arrest. *New England Journal of Medicine* 2002 Feb 21;346(8):549-56.

<sup>4</sup> Bernard SA, Gray TW, Buist MD, Jones BM, Silvester W, Gutteridge G, et al. Treatment of comatose survivors of out-of-hospital cardiac arrest with induced hypothermia. *New England Journal of Medicine* 2002 Feb 21;346(8):557-63.

<sup>5</sup> Polderman KH. Hypothermia and neurological outcome after cardiac arrest: State of the art: *European Journal of Anaesthesiology Suppl* 2008;42:23-30.

<sup>6</sup> Shankaran S, Laptook AR, Ehrenkranz RA, Tyson JE, McDonald SA, Donovan EF, et al. Whole-body hypothermia for neonates with hypoxic-ischemic encephalopathy. *New England Journal of Medicine* 2005 Oct 13;353(15):1574-84.

## Noninvasive Imaging to Quantify Peripheral Nerve Injury and Repair in Clinic

Can diffusion tensor imaging (DTI) of peripheral nerves reliably assess the extent of nerve fiber degeneration and regeneration? Led by principal investigator Kazim A. Sheikh, M.D., a professor in the department of Neurology at UTHealth Medical School, researchers are investigating the capability of DTI to quantify nerve injury, particularly to axons, and measure repair over time. The three-year, single-center study is funded by the National Institutes of Health (NIH), and is currently recruiting participants.



**KAZIM A. SHEIKH, M.D.**  
Professor, Department of Neurology  
Director, Neuromuscular Program  
UTHealth Medical School

“Because diseases of the peripheral nerves are among the most common neurological conditions, the morbidity and cost of care associated with these neuropathic conditions are enormous,” says Dr. Sheikh, who is renowned for his work in the area of autoimmune and inflammatory neuropathies. He has served as principal or co-principal investigator in studies funded by the NIH, the GBS Foundation, MDA, the National Institute of Environmental Health Sciences and the National Multiple Sclerosis Society, among others.

“As clinicians, we have an immediate need for reliable measures to assess peripheral nerve regeneration in patients with traumatic nerve injuries,” he says. “If the DTI techniques we’re using in this study are successful in quantifying nerve injury and repair, we’ll have a new tool to gauge the efficacy of the therapeutics we use to enhance nerve regeneration and repair.” DTI is a magnetic resonance imaging technique based on the movement of water molecules within biological



**An anteromedial view of the nerves of the elbow relative to the skeleton.**

tissues and is particularly suitable for imaging nerve fiber tracts.

The clinical trial builds on earlier research by Dr. Sheikh and his team, including a study of 10 healthy controls designed to implement a DTI protocol for visualization of peripheral nerves in the human forearm.<sup>1</sup> That study demonstrated that DTI-derived maps delineated forearm nerves more clearly than images acquired with other sequences, and the researchers concluded that DTI is superior in visualizing the medial and ulnar nerves of the forearm.

During the course of the current study, 75 adults age 18 to 50 who meet the inclusion criteria will be enrolled; currently, 10 subjects have been selected to participate. Inclusion criteria include traumatic and/or mechanical injury to upper-extremity median, ulnar or radial nerves with or without nerve repair.

Patient confidentiality will be maintained, and the results of each patient’s DTI scans will be shared with referring physicians. For more information or to refer a patient, contact Carla Wilkerson, research coordinator, at 713.500.6785 or via email at [carla.d.wilkerson@uth.tmc.edu](mailto:carla.d.wilkerson@uth.tmc.edu), or contact Dr. Sheikh at 713.500.6784 or via email at [kazim.sheikh@uth.tmc.edu](mailto:kazim.sheikh@uth.tmc.edu).

<sup>1</sup> Zhou Y, Kumaravel M, Patel VS, Sheikh KA, Narayana PA. Diffusion tensor imaging of forearm nerves in humans. *Journal of Magnetic Resonance Imaging*, 2012;36:920-927.

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