

# MEMORIAL HERMANN

MISCHER NEUROSCIENCE INSTITUTE

# JOURNAL

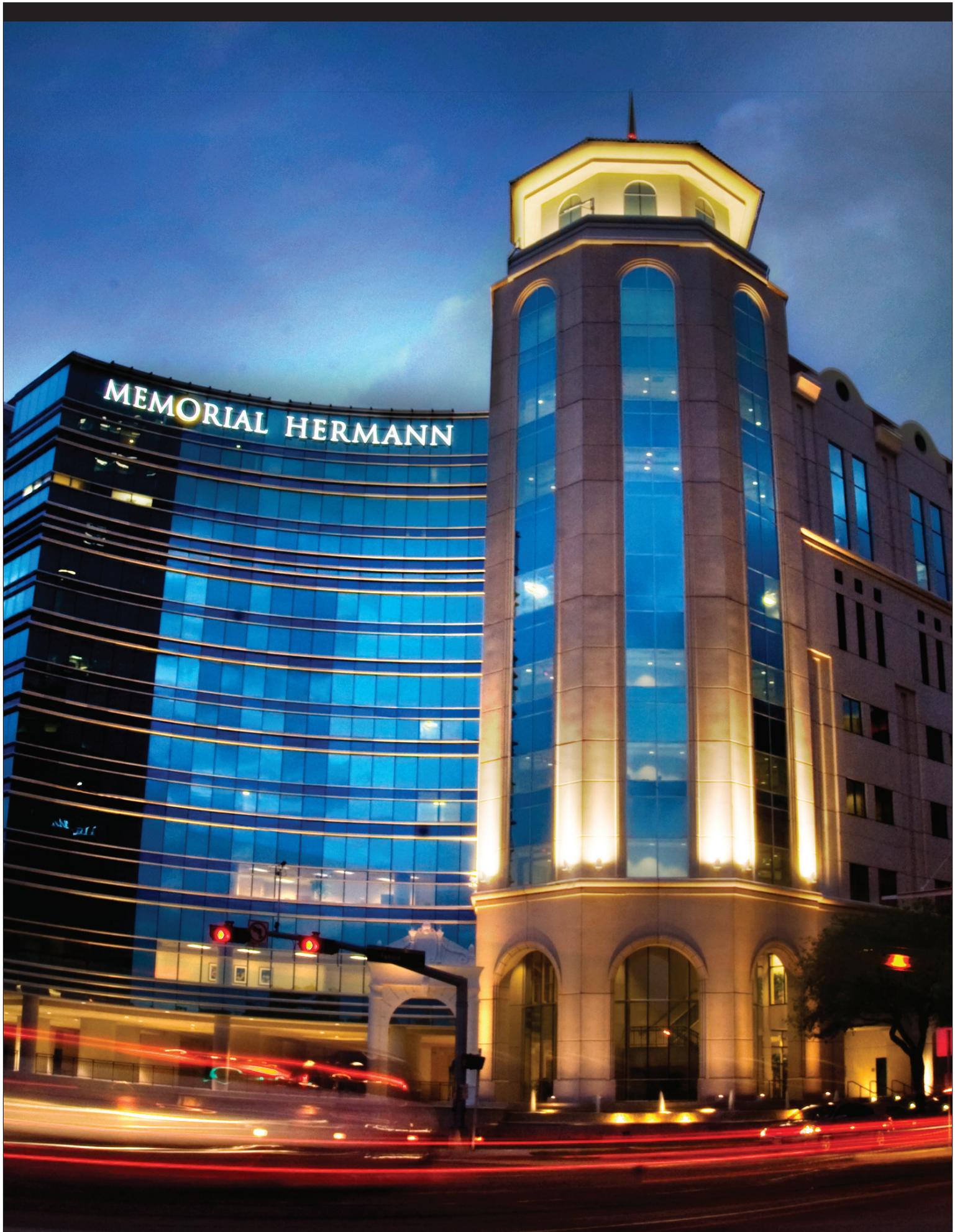
TEXAS MEDICAL CENTER



Mischer  
Neuroscience Institute

MEMORIAL<sup>®</sup>  
HERMANN

Affiliated with The University of Texas Medical School at Houston



# WELCOME

WE'RE PLEASED TO PRESENT the first issue of the Mischer Neuroscience Journal, a biannual publication of the Mischer Neuroscience Institute in collaboration with The University of Texas Medical School at Houston. Each issue of the Journal will highlight breakthroughs in research and clinical practice that are happening at the Institute.

In this issue you'll find an overview of the goals, objectives and history of the Institute, as well as two patient stories: a 23-year-old man diagnosed and surgically treated for an "inoperable" right parieto-occipital arteriovenous malformation and a 47-year-old stroke patient diagnosed through remote-presence telemedicine that linked an emergency physician to experts at the Institute's renowned Stroke Center. A third feature article reviews ongoing research investigating the effects of hypothermia on survival rates for patients recovering from stroke and other neurological injuries.

The Institute is the first in Texas and one of only a few institutions in the country to fully integrate neurology, neuroradiology, neurosurgery and neurorehabilitation through comprehensive, specialized treatment centers and close collaboration between all involved disciplines. If you have questions about our program, please call us at 713.500.6170 or 713.500.7088. If you would like to discuss or refer a patient, please call our referral lines at 832.325.7090 or 832.325.7080. We're here to help.

We hope you'll find the first issue of the Mischer Neuroscience Institute Journal interesting and informative.

With best wishes,

## **Dong H. Kim, M.D.**

DIRECTOR, MISCHER NEUROSCIENCE  
INSTITUTE AT MEMORIAL HERMANN

PROFESSOR AND CHAIR,  
DEPARTMENT OF NEUROSURGERY,  
THE UNIVERSITY OF TEXAS MEDICAL  
SCHOOL AT HOUSTON

## **James C. Grotta, M.D.**

CO-DIRECTOR, MISCHER  
NEUROSCIENCE INSTITUTE AT  
MEMORIAL HERMANN

CHIEF OF NEUROLOGY, MEMORIAL  
HERMANN-TEXAS MEDICAL CENTER

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FOR MORE INFORMATION ABOUT THE MNI, CALL 713.704.0916.

# BY LEAPS AND BOUNDS

MISCHER NEUROSCIENCE INSTITUTE EXPANDS INSIDE AND OUTSIDE  
THE TEXAS MEDICAL CENTER

**F**ROM GAMMA KNIFE radiosurgery and brain mapping with MEG technology to advanced care for neurovascular diseases, epilepsy, stroke, multiple sclerosis and movement disorders, Memorial Hermann-Texas Medical Center was the first hospital in Houston to offer a comprehensive neuroscience program, with many of its specialty centers in place for decades. In 2006, with a gift from Houston businessman and philanthropist Walt Mischer and his family, these specialty centers came together within the new Mischer Neuroscience Institute at Memorial Hermann.

**THE MISCHER NEUROSCIENCE INSTITUTE BRINGS TOGETHER A TEAM OF WORLD-CLASS CLINICIANS, RESEARCHERS AND EDUCATORS WHOSE INSIGHTS AND RESEARCH FINDINGS ARE TRANSFORMING THE FIELD OF NEUROSCIENCE.**

Led by neurosurgeon Dong H. Kim, M.D., a recent recruit from Harvard, and neurologist James C. Grotta, M.D., an internationally known stroke expert, the Mischer Neuroscience Institute (MNI) brings together a team of world-class clinicians, researchers and educators whose insights and research findings are transforming the field of neuroscience.

“Our centers of excellence are staffed by nationally known physicians from The University of Texas Medical School at Houston who are committed to raising the bar with first-rate clinical programs and breakthrough research applied daily in the OR and at the bedside,” says Dr. Kim, who is director of the Institute, chief of neurosurgery at Memorial Hermann-TMC and chair of the department of Neurosurgery at the UT Medical School. “We’re currently ranked No. 3 nationally in National Institutes of Health awards for neuro-

## MEET THE MISCHER NEUROSCIENCE INSTITUTE TEAM

### NEUROSURGERY

#### **Dong Kim, M.D.**

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*CEREBROVASCULAR SURGERY AND BRAIN TUMORS*

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THE UNIVERSITY OF TEXAS MEDICAL SCHOOL AT HOUSTON  
*COMPLEX SPINAL SURGERY, MINIMALLY INVASIVE SURGERY,  
GENERAL NEUROSURGERY*

#### **Roc Chen, M.D.**

ASSISTANT PROFESSOR, DEPARTMENT OF NEUROSURGERY  
THE UNIVERSITY OF TEXAS MEDICAL SCHOOL AT HOUSTON  
*ENDOVASCULAR NEUROSURGERY, SKULL BASE AND  
CEREBROVASCULAR SURGERY*

#### **Guy Clifton, M.D.**

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*NEUROTRAUMA*

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*COMPLEX SPINAL SURGERY AND MINIMALLY INVASIVE  
SPINAL SURGERY*

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*SURGICAL MANAGEMENT OF MEDICALLY REFRACTORY  
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#### **Alex Valadka, M.D.**

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*COMPLEX SPINAL SURGERY AND MINIMALLY INVASIVE  
SPINAL SURGERY*

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FOR MORE INFORMATION ABOUT THE MNI,  
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**Dr. Dong H. Kim**  
Chief of Neurosurgery



**Dr. James Grotta**  
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## MEET THE MISCHER NEUROSCIENCE INSTITUTE TEAM (CONT.)

### NEUROSURGERY RESEARCH FACULTY

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*STEM CELL THERAPY*

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*SPINAL CORD INJURY*

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*BRAIN INJURY AND MEMORY*

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#### **Hariyadarshi Pannu, Ph.D.**

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*OXIDATIVE STRESS AND BRAIN INJURY*

surgery, with research grants in excess of \$14 million. Clinical trials under way focus on brain and spinal cord trauma, hemorrhage, stroke, genetic predisposition to aneurysm and adult stem cell research.” The Institute is well placed in the Houston healthcare market and preparing to expand. “Our neuroscience program has been the longstanding market-share leader for the Houston community,” says Juanita Romans, chief executive officer of Memorial Hermann-TMC. “The Mischer Institute is the first center in Texas and one of only a few institutions in the country to fully integrate neurology and neurosurgery in complementary programs. The close working relationship between the two departments has allowed us to create

Telemedicine links between those centers and MNI neurologists are being established to ensure 24/7 emergency consultation.

At the core of MNI’s longstanding reputation for excellence is its Stroke Center, founded by Dr. Grotta’s team in 1988 as the first stroke center in Houston, one of the first dedicated stroke programs in the world and the first Joint Commission-accredited primary stroke center in the region. The Center was the first in Houston and one of the first in the United States to test tPA for acute stroke, and it remains the United States leader in number of acute stroke patients treated with tPA, with an administration track record of more than 10 times the national average.

“Based on these and other accomplish-

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**THE CLOSE WORKING RELATIONSHIP BETWEEN THE TWO DEPARTMENTS  
HAS ALLOWED US TO CREATE TRUE CENTERS OF EXCELLENCE AND  
ASSURE OUR PATIENTS HIGHLY COORDINATED CARE ENCOMPASSING THE  
FULL RANGE OF NEUROSCIENCE.**

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true centers of excellence and assure our patients highly coordinated care encompassing the full range of neuroscience.”

Construction began in the fall of 2007 on the Institute’s new \$13.5 million, 32-bed Neuro Intensive Care Unit, which will increase capacity by 30 percent. As part of Memorial Hermann-TMC’s 10-year master plan, Jones Pavilion will be transformed into a 163-bed neuroscience institute. The first phase of MNI’s new facilities will open in 2009.

The expansion at MNI is part of the 11-hospital Memorial Hermann Healthcare System’s neuroscience strategic plan, which builds on Memorial Hermann-TMC’s leadership position in the market. The plan includes extending the Institute’s expertise to the suburbs through neuroscience centers of excellence at Memorial Hermann Southwest Hospital, Memorial Hermann Memorial City Medical Center and Memorial Hermann The Woodlands Hospital.

ments, we are the only Center in Houston selected by the National Institutes of Health to develop and test other new stroke therapies,” says Dr. Grotta, who is co-director of MNI, chief of neurology at Memorial Hermann-TMC and chairman of the department of Neurology at the UT Medical School. “Stroke research at MNI includes several evaluations of potentially breakthrough acute stroke treatments and stroke prevention trials, such as an NIH-funded Phase III randomized study of carotid artery surgery versus stenting for stroke prevention and a randomized evaluation of recurrent stroke prevention comparing patent foramen ovale closure to established standard-of-care treatment.”

As part of the MNI expansion plan, Dr. Kim will collaborate with neurosurgeons from across the Memorial Hermann system to develop neuroscience capabilities across the greater Houston area and surrounding communities under the Mischer Neurosurgical Associates umbrella.

## MEET THE MISCHER NEUROSCIENCE INSTITUTE TEAM (CONT.)

### NEUROLOGY

#### James C. Grotta, M.D.

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CHIEF OF NEUROLOGY

DIRECTOR, STROKE CENTER

MEMORIAL HERMANN-TEXAS MEDICAL CENTER

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*CEREBROVASCULAR DISEASE AND STROKE*

#### Parveen Athar, M.D.

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*NEUROMUSCULAR DISEASES AND CLINICAL NEUROPHYSIOLOGY*

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*GENERAL NEUROLOGY, ELECTROMYOGRAPHY*

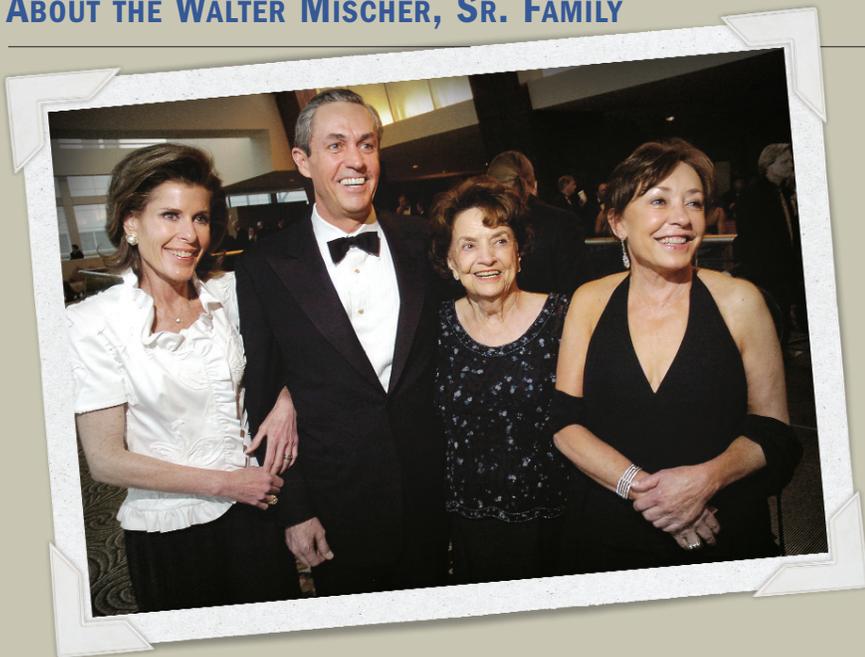
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THE UNIVERSITY OF TEXAS MEDICAL SCHOOL AT HOUSTON

*EPILEPSY AND CLINICAL NEUROPHYSIOLOGY*

## ABOUT THE WALTER MISCHER, SR. FAMILY



Through their many business and philanthropic activities, the Walter Mischer, Sr. family has helped build and shape a community that people are proud to call home. Their affiliated companies in banking, construction, homebuilding and community development have played a vital role in the growth and prosperity of the Greater Houston area.

The Mischer family first became involved with Memorial Hermann more than 30 years ago when Walter M. Mischer, Sr. joined the board of trustees of what was then known as Hermann Hospital. Walter Mischer, Jr. followed in his father's footsteps, sitting on the Board of Trustees of Hermann Hospital in the late 1980s and early 1990s and acting as interim chief executive officer of the hospital.

The Mischers have also been financially supportive of Memorial Hermann for many years. Significant past contributions have benefited the Gamma Knife at Memorial Hermann-Texas Medical Center, the Mischer Historical Video project, Children's Memorial Hermann Hospital and Circle of Life Galas sponsored by the Memorial Hermann Foundation.

In 2005, the Mischer family made a significant lead gift for the establishment of the Mischer Neuroscience Institute at Memorial Hermann-TMC, a lasting tribute to Mary A. and Walter M. Mischer, Sr.

An unassuming man who preferred to keep a low profile, the late Walter Mischer, Sr. greeted everyone who met him with open arms. He believed strongly that he and his family should give back to the community. Memorial Hermann is grateful for his generosity.

Dr. Kim is a graduate of Stanford University and the University of California, San Francisco School of Medicine. After general surgery training at Harvard, he completed neurosurgery training under Dr. Charles Wilson at UCSF. He went on to complete a fellowship in cerebrovascular surgery and skull base tumors with Arthur Day, M.D. He has held academic and hospital appointments

at Cornell University Medical College, The New York Hospital, Sloan-Kettering Cancer Center, Harvard Medical School and Brigham and Women's Hospital, and the Dana-Farber Cancer Institute.

From 1998 to 2003, Dr. Kim was a UT Medical School faculty member and founded the Comprehensive Center for Cerebrovascular Surgery at Memorial Hermann-TMC. His areas of clinical inter-

**The Mischer family from left to right: Leila Mischer, Walt Mischer, Mary Mischer, the wife of the late Walter M. Mischer, Sr. and Paula Mischer.**

## MEET THE MISCHER NEUROSCIENCE INSTITUTE TEAM (CONT.)

### J. William Lindsey, M.D.

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THE UNIVERSITY OF TEXAS MEDICAL SCHOOL AT HOUSTON  
*MULTIPLE SCLEROSIS*

### Raymond A. Martin, M.D., F.A.A.N.

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*GENERAL NEUROLOGY, MULTIPLE SCLEROSIS, STROKE AND NEUROMUSCULAR DISEASES*

### Flavia Nelson, M.D.

ASSISTANT PROFESSOR, DEPARTMENT OF NEUROLOGY  
ASSOCIATE DIRECTOR, MAGNETIC RESONANCE IMAGING ANALYSIS CENTER  
MULTIPLE SCLEROSIS RESEARCH GROUP  
THE UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER AT HOUSTON  
*MULTIPLE SCLEROSIS*

### Elizabeth Noser, M.D.

MEDICAL DIRECTOR, MISCHER NEUROREHABILITATION, MEMORIAL HERMANN-TEXAS MEDICAL CENTER  
STROKE DIRECTOR, MEMORIAL HERMANN SUGAR LAND HOSPITAL  
MEDICAL DIRECTOR OF NEUROREHABILITATION, MEMORIAL HERMANN HEALTHCARE SYSTEM  
CLINICAL ASSISTANT PROFESSOR, DEPARTMENT OF NEUROLOGY  
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*NEUROREHABILITATION*

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CO-DIRECTOR, STROKE PROGRAM  
DIRECTOR, VASCULAR NEUROLOGY FELLOWSHIP  
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*CEREBROVASCULAR DISEASE AND STROKE*

### Mya Schiess, M.D.

PROFESSOR AND VICE CHAIR, DEPARTMENT OF NEUROLOGY  
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DIRECTOR, NEUROLOGY TRAINING PROGRAM  
DIRECTOR, UT MOVE  
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*MOVEMENT DISORDERS, NEURODEGENERATIVE DISEASES AND SPASTICITY*

### Kazim Shiekh, M.D.

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### Jeremy Slater, M.D.

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THE UNIVERSITY OF TEXAS MEDICAL SCHOOL AT HOUSTON  
*ADULT EPILEPSY AND SLEEP DISORDERS*

## MISCHER NEUROSCIENCE INSTITUTE: AN UNRIVALED HISTORY OF FIRSTS

The first Stroke Center in Houston and one of the first dedicated stroke programs in the world.

The first center to conduct a national, multi-center trial for hypothermia in head injury.

The first neurosurgery center to offer all advanced modalities of treatment – expert microsurgery, interventional neuroradiology/endovascular surgery and Gamma Knife – for complex lesions.

The North American leader in studies of primary progressive multiple sclerosis and the most active center in Texas in the conduct of organized clinical trials of new therapies for MS.

The first in Houston and one of the first in the United States to test the clot-dissolving drug tPA for acute stroke.

The first center in Houston to test and prove the efficacy of three disparate treatments for stroke prevention: carotid surgery; administration of antiplatelet drugs, including aspirin; and patent foramen ovale closure.

The first in the region to do vagus nerve stimulation, and the national leader in number of vagal nerve stimulators implanted in epilepsy patients.

Brought the first clinical magnetoencephalography (MEG) sensor to Houston. It remains the only MEG in clinical use throughout Texas, Louisiana, Arkansas and Oklahoma.

One of only a few inpatient Epilepsy Monitoring Units in the country with the unique capability of simultaneously performing electroencephalography and polysomnography.

TIRR Memorial Hermann (The Institute for Rehabilitation and Research) is the only center in Houston - and one of only seven designated centers in the nation - in the Christopher and Dana Reeve Foundation NeuroRecovery Network, and one of only six in the United States designated as model systems by the National Institute on Disability and Rehabilitation Research (NIDRR) for both its spinal cord injury and traumatic brain injury programs.



## MEET THE MISCHER NEUROSCIENCE INSTITUTE TEAM (CONT.)

### Erin Furr Stimming, M.D.

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MOVEMENT DISORDERS SPECIALIST, UT MOVE  
DIRECTOR, NEUROLOGY CLERKSHIP PROGRAM  
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*MOVEMENT DISORDERS, NEURODEGENERATIVE DISEASES  
AND SPASTICITY*

### Shuichi Suzuki, M.D.

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*DIAGNOSTIC AND INTERVENTIONAL NEURORADIOLOGY*

### Gage Van Horn, M.D.

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THE UNIVERSITY OF TEXAS MEDICAL SCHOOL AT HOUSTON  
*MOVEMENT DISORDERS, NEURODEGENERATIVE DISEASES  
AND SPASTICITY*

### Frank Yatsu, M.D.

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*CEREBROVASCULAR DISEASE AND STROKE*

### Jerry S. Wolinsky, M.D.

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*MULTIPLE SCLEROSIS AND NEUROIMAGING*

## NEUROLOGY RESEARCH FACULTY

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*STROKE AND INFLAMMATION*

### Gang Zhang, Ph.D.

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*PERIPHERAL NEUROPATHY*

## CHILDREN'S NEUROSCIENCE CENTER

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*PEDIATRIC NEUROSURGERY - EPILEPSY SURGERY AND  
CRANIOFACIAL SURGERY*

### John Jones, M.D.

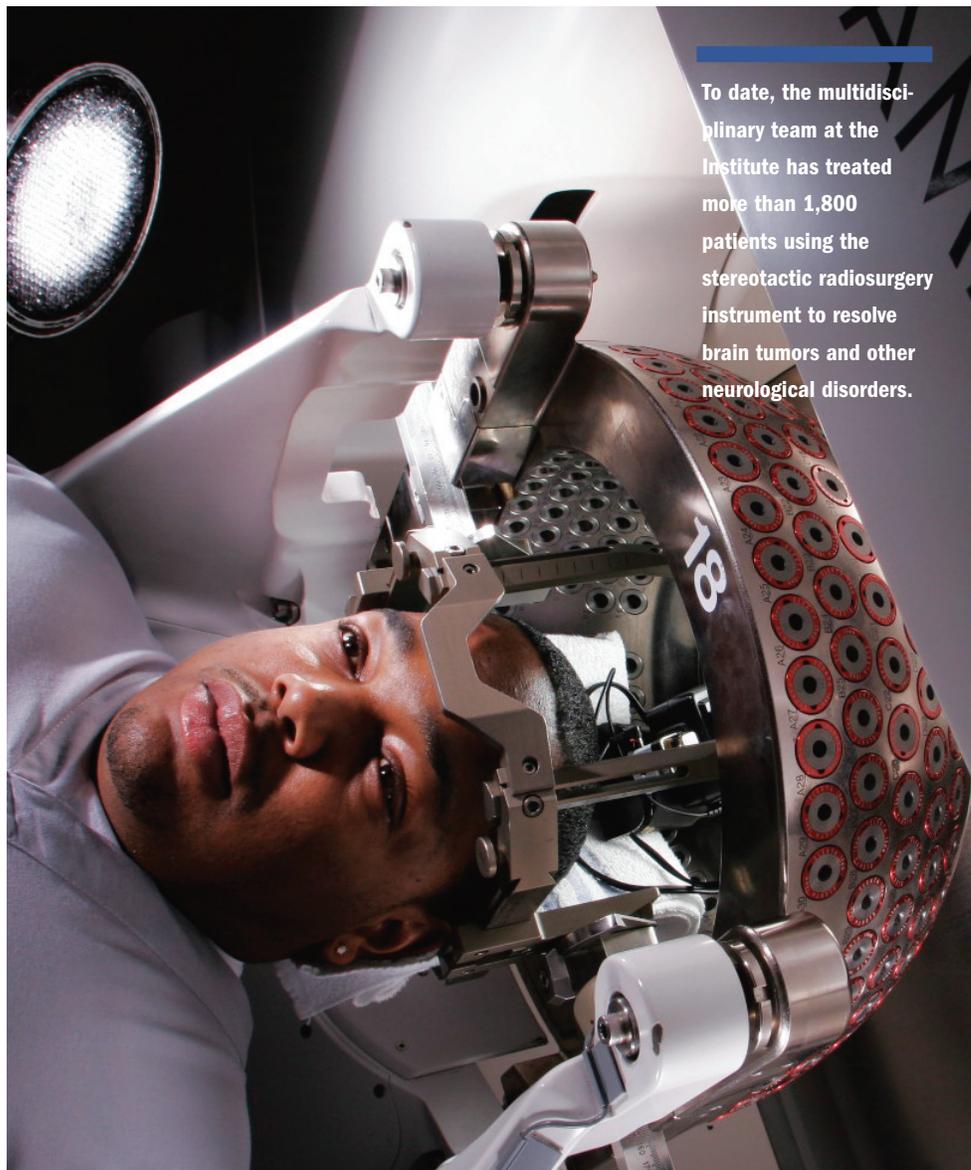
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THE UNIVERSITY OF TEXAS MEDICAL SCHOOL AT HOUSTON  
*PEDIATRIC NEUROSURGERY*

est include intracranial aneurysms, brain tumors, arteriovenous malformations.

In addition to his leadership role at MNI, Dr. Grotta is a professor of neurology at the UT Medical School and director of the Stroke Center at Memorial Hermann-TMC. He holds the Roy M. and Phyllis Gough Huffington Distinguished Chair in Neurology, and is funded by the National Institutes of Health with grants to carry out research from the laboratory to the bedside and to train new fellows in the field of stroke. Dr. Grotta joined the UT Medical School faculty in 1979. His research focuses on the development of new therapies for acute stroke patients, including experimental laboratory studies on the biology of brain injury and recovery after stroke, and clinical studies of throm-

bolytic drugs and other approaches to reducing brain damage and improving recovery after stroke.

“Dr. Kim’s return to Houston more closely knits an already strong relationship between the neurology and neurosurgery programs at the UT Medical School and Memorial Hermann,” Dr. Grotta says. “We’re already collaborating on Dr. Kim’s genetic research, and faculty members from both programs will work together to advance neuroscience clinical care activities at the MNI. Memorial Hermann’s commitment to growing the Institute at the Texas Medical Center and expanding our expertise to the suburbs will propel us to a new level of excellence.” ■



To date, the multidisciplinary team at the Institute has treated more than 1,800 patients using the stereotactic radiosurgery instrument to resolve brain tumors and other neurological disorders.

## MEET THE MISCHER NEUROSCIENCE INSTITUTE TEAM (CONT.)

### Ian J. Butler, M.D.

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DEPARTMENT OF PEDIATRICS  
PROFESSOR, DIVISION OF CHILD & ADOLESCENT NEUROLOGY,  
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*PEDIATRIC NEUROLOGY - HEADACHE*

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*PEDIATRIC NEUROLOGY - EPILEPSY*

# THE JOSEPH SANTOS STORY

A SURGICAL CURE FOR AN INOPERABLE PATIENT

**J**OSEPH SANTOS celebrated his 23rd birthday on February 25, 2008. It's just short of a miracle that he's still alive. Diagnosed in 1998 with a giant right parieto-occipital arteriovenous malformation, Santos had been told by three neurosurgeons – two in Houston and one near his home in San Antonio – that his AVM was inoperable.

Untreated AVMs can hemorrhage over time. In the 10 years that followed his diagnosis, Santos underwent serial glue embolizations at another hospital in Houston to prevent the abnormal blood

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**I LOOKED AT THE AVM VERY CAREFULLY AND FELT THAT IT WAS RESECTABLE," DR. KIM SAYS. "IT WAS A HIGH-RISK SITUATION BUT I ALSO FELT THAT, GIVEN THE TRAUMATIC NATURE OF THE RUPTURE, WE HAD TO MOVE FORWARD WITH THE SURGERY TO PREVENT FUTURE HEMORRHAGES.**

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vessels from rupturing. During an embolization, an interventional neuroradiologist threads a catheter through a small incision in the groin to the site of the AVM. Various materials, including glue, may be injected into the blood vessels to close them in an attempt to prevent hemorrhage. But embolization alone is usually ineffective and should be accompanied by resection of the AVM by a surgeon.

On November 21, 2007, despite the embolizations, Santos' AVM ruptured. "It was the day before Thanksgiving," recalls his mother, Karen Walls. "We drove him to the ER at a hospital in San Antonio. The doctor who examined Joseph told us that, normally, people who have this kind of rupture are dead. He called every hospital in San Antonio, but no one had a neurosurgeon capable of treating the AVM. One of the last ERs he called rec-

ommended Dr. Dong Kim."

Santos was transported by air ambulance from San Antonio to Memorial Hermann-Texas Medical Center, arriving at 1:30 a.m., comatose and paralyzed on the left side. By the time his parents drove in two hours later, he'd been stabilized. Dr. Kim had placed an emergency ventriculostomy and Santos' neurological status improved slowly to the point that he could follow commands.

"I looked at the AVM very carefully and felt that it was resectable," Dr. Kim says. "It was a high-risk situation, but I also felt that given the traumatic nature of the rupture we had to move forward with the surgery to prevent future hemorrhages."

"Dr. Kim discussed the risks and benefits of surgery with us," says Karen Walls. "After having been told by other neurosurgeons that Joseph's AVM was inoperable, I was surprised and I have to admit kind of leery. But Dr. Kim told us he'd trained extensively for this specific kind of surgery, so we decided to go forward with it."

During the following week and a half, interventional radiologist Shuichi Suzuki, M.D., a member of Dr. Kim's neurosurgical team and an assistant professor in the department of Radiology at the UT Medical School, performed preoperative embolizations to reduce surgical risk. On December 6, Santos was wheeled into the OR at 8:30 a.m. to be prepped for what would turn out to be a 24-hour procedure. After placement of a sheath for intraoperative angiography and connection of EEG and other key monitoring equipment, Dr. Kim made a large occipitoparietal craniotomy in two pieces, spanning the superior sagittal sinus, using microdissection techniques performed with an operating microscope.

He began by dissecting along the lateral margin of the AVM, away from the majority of the vessels feeding into it. Next, he went in superiorly, dissecting and coagulating the ACA and MCA feeders and detaching them from the AVM. From there, he proceeded more medially, entering the clot cavity to remove a large portion of the intracranial hemorrhage. For



each part, Dr. Kim had to individually identify tiny arteries connected to the AVM, then individually disconnect it so that the lesion could be removed safely.

“Once the superior margin was done, I was able to come across the medial margin to disconnect the feeders from the posterior cerebral artery,” Dr. Kim says. “Finally, we began the medial dissection deep around the AVM.” Once he had 90 percent of the AVM dissected, he disconnected it from its main venous drainage to work around the last remaining remnants. A final intraoperative angiogram showed complete resection.

“We were discharged on the 21st of December,” Walls says. “It was my birthday, and I remember telling Dr. Kim that it was the best birthday present I’d ever had.”

Santos was transferred home to San Antonio for inpatient rehabilitation. He was discharged on New Year’s Eve and began outpatient rehabilitation on January 7.

“He’s doing very well,” Walls says. “In

addition to his outpatient therapy, we’ve been working with Joseph at home. He’s just beginning to walk around our house without his walker. We have 14 steps, and he can climb with minimal assistance and walk down as well. In a short time, he’s gone from being paralyzed on the left side to walking. His rehab team is amazed.”

“Joseph’s prognosis is good,” Dr. Kim says. “He’s cured of the AVM and getting over the effects of the hemorrhage. Every year that a patient lives with an AVM, there’s a 4 percent chance that it will rupture. Over the 10 years that passed between Joseph’s diagnosis and the resection, his chance of rupture had been 40 percent. He’s a young man with a life ahead of him. Had we prevented the hemorrhage in the first place, he wouldn’t have had to overcome paralysis with a long course of rehab. It’s our goal to prevent stories like this from happening by diagnosing AVMs early and removing them before they cause devastating damage.” ■

**Dr. Kim is focused on working with primary care physicians to diagnosis AVM’s early so they can be removed before damage occurs.**



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# ADVANCES IN TELEMEDICINE

A PATIENT BENEFITS FROM NEW TECHNOLOGY THAT ALLOWS STROKE EXPERTS TO BE IN TWO PLACES AT ONCE

**S**ID MYERS WAS GETTING READY for work when he noticed the clumsiness on his right side. “I was holding a cup of coffee in my right hand, and the coffee kept spilling out,” says Myers, a 47-year-old driver for UPS. “Then my arm became numb from the elbow to the hand. I could tell my face was also affected. My wife came downstairs, looked at me and said, ‘Sid, you’re having a stroke.’”

Julie Myers called a neighbor for help and drove her husband to Memorial Hermann Sugar Land Hospital, located about 10 minutes from their home. “By

**THE HOSPITALS ARE LINKED ELECTRONICALLY TO OUR NEUROLOGY DEPARTMENT, PROVIDING REAL-TIME VISUAL INTERACTION BETWEEN NEUROLOGISTS AND PATIENTS, AND ALLOWING NEUROLOGISTS TO REVIEW CT SCANS AND ADVISE LOCAL PHYSICIANS ON TREATMENT OPTIONS.**

the time we arrived at the hospital, my entire right side was gone,” Myers says. “I couldn’t walk and when they wheeled me to the Emergency Center, my arm kept sliding off the armrest of the wheelchair.”

Myers was admitted to Memorial Hermann Sugar Land on June 26, 2008. The emergency physician in charge of his case ran through the standard medical protocols for stroke – and followed a new one. He paged the physician on call for telemedicine at the Mischer Neuroscience Institute Stroke Center. Founded at Memorial Hermann-Texas Medical Center in 1988 by neurologist James C. Grotta, M.D., the Stroke Center is the 10-county greater Houston area’s largest and busiest dedicated 24/7 onsite stroke team and the United States leader in number of acute stroke patients treated with tPA.

Vascular neurology fellow Anitha Abraham, M.D., was on call for telemedi-

cine the morning Myers was admitted to Memorial Hermann Sugar Land. At her control station in the Texas Medical Center, Dr. Abraham logged on to Memorial Hermann-TMC’s RP-7™ Remote Presence System, a new robotic teleconferencing technology currently linked to two outlying Memorial Hermann hospitals, in southwest Houston and Sugar Land. Pioneered by InTouch Health, the Remote Presence System is a robot that can be remotely maneuvered by the stroke team member on call. It is equipped with two-way video capability that allows physicians to consult with specialists, see patients and view monitors and other clinical data sources firsthand from remote locations.

“Dr. Abraham could tell by the data she was receiving that Mr. Myers was having a severe stroke,” says Dr. Grotta, who is co-director of MNI, chief of neurology at Memorial Hermann-TMC and chairman of the department of Neurology at The University of Texas Medical School at Houston. “He did not qualify for the approved acute stroke treatment tPA, and we could tell by the severity of his symptoms that the stroke was caused by an occlusion in a larger artery. Because the CT scan done at Memorial Hermann Sugar Land did not show an established infarct, we thought we might be able to salvage tissue with endovascular treatment.”

Myers was transferred to MNI by Memorial Hermann Life Flight®. “He started to improve during the helicopter transport,” Dr. Grotta says. “Still, we felt that with the carotid artery almost totally blocked and low blood flow to the brain, he would redevelop a significant neurological deficit without further treatment.”

The stroke team moved quickly. A CT perfusion study done at MNI showed significant blood flow reduction in the watershed area of the artery. An arteriogram revealed that the occluded artery had dissected. By 10:30 a.m., Shuichi Suzuki, M.D., an interventional radiologist affiliated with MNI, had opened the occluded portion of the artery with the recently



FOR MORE INFORMATION ABOUT THE TELEMEDICINE PROGRAM, CALL 713.500.7088.

approved Penumbra Stroke System, an innovative clot-retrieval device that uses suction to remove blood clots in the brain for treatment of acute ischemic stroke. Dr. Suzuki placed a stent and then threaded the system's microcatheter into the brain, where he dissolved a second clot with an arterial injection of urokinase.

Myers had returned to normal neurologic function by that evening.

An echocardiogram ensured that his heart had no abnormality, and he was released the following day. "This is a clear-cut example of the value of telemedicine," Dr. Grotta says. "Without telemedicine capabilities at Memorial Hermann Sugar Land, Mr. Myers might have expected a dramatically different outcome. He suffered a major stroke, was aphasic and hemiplegic when he presented in the Emergency Center, but thanks to Dr. Abraham's accurate assessment and the fast action of our team, he made a full recovery."

Myers returned to work within a week. "My energy was back about two days after I left the hospital, and I felt completely normal," he says. "They said I was very lucky."

"Much can be done for stroke patients in community hospitals, especially if the Emergency Center is set up for telemedicine," says Dr. Grotta. "Our new remote presence technology is playing a vital role in Memorial Hermann's system-wide neuroscience strategic plan, which is extending our expertise to the suburbs through neuroscience centers of excellence at Memorial Hermann Southwest, Memorial Hermann Memorial City and Memorial Hermann The Woodlands hospitals."

All hospitals around the Memorial Hermann system have achieved Joint Commission certification as primary stroke centers. The RP-7 system will enhance the UT Neurology department's existing telemedicine program, which extends emergency expertise on all neurological conditions to community hospitals throughout the state of Texas. The hospitals are linked electronically to the UT Neurology department, providing real-time visual interaction between neurolo-

gists and patients, and allowing neurologists to review CT scans and advise local physicians on treatment options.

"We've further expanded our telemedicine program working in conjunction with Specialists on Call, a service that provides highly trained specialists around the clock to hospitals equipped for videoconferencing," Dr. Grotta says. "With our new remote presence technology and expanded telemedicine capabilities, we expect to have more stories like Sid Myers' to tell." ■



**The RP-7™ Remote Presence System, links Memorial Hermann-Texas Medical Center to two suburban Memorial Hermann hospitals.**

# MISCHER NEUROSCIENCE INSTITUTE AND UT WELCOME NEW RECRUITS

SIX NEW PHYSICIANS – TWO NEUROLOGISTS AND FOUR NEUROSURGEONS – HAVE JOINED THE MEDICAL STAFF AT THE MISCHER NEUROSCIENCE INSTITUTE (MNI) AND THE FACULTY OF THE UNIVERSITY OF TEXAS MEDICAL SCHOOL AT HOUSTON.



Sheikh

**Kazim Sheikh, M.D.**, professor of neurology and director of the Neuromuscular division, joins the MNI neurology team from the Johns Hopkins University School of Medicine. He received his medical degree at King Edward Medical College in Lahore, Pakistan, in 1987 and completed his residency in neurology at the Neurological Institute, Columbia University in New York City, followed by a postdoctoral fellowship in peripheral nerve at Johns Hopkins.

An established physician-scientist, Dr. Sheikh 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 National Institutes of Health, the GBS Foundation, MDA, the National Institute of Environmental Health Sciences, Johns

Hopkins University and the National Multiple Sclerosis Society. He brings with him to Memorial Hermann research grants totaling more than \$1.5 million, focused in several areas related to neuromuscular diseases, autoimmune neuropathies and peripheral nerve regeneration. Dr. Sheikh focuses on neuromuscular disorders in adults, with an emphasis on peripheral neuropathies, including Guillain-Barre syndrome and chronic inflammatory demyelinating polyneuropathy (CIDP). He is available to consult on any area of neuromuscular disorders, including diseases affecting the anterior horn cell, peripheral nerve or nerve roots, neuromuscular junction and muscle, in addition to providing nerve and muscle biopsy expertise.



Barreto

**Andrew Barreto, M.D.**, assistant professor of neurology, received his medical degree in 2002 at Wake Forest University School of Medicine in Winston-Salem, North Carolina. He completed his residency in internal medicine at the University of

Maryland Hospital in Baltimore, followed by a residency in neurology at the University of Alabama at Birmingham Hospital. He completed a neurovascular fellowship in stroke under the mentorship of James C. Grotta, M.D., at the UT Medical School and Memorial Hermann-Texas Medical Center.

Dr. Barreto has developed particular expertise in ultrasound and ultrasound-enhanced clot lysis, as well as other aspects of blood flow imaging. He is a co-investigator in several trials in progress at the UT Medical School and Memorial Hermann aimed at enhancing clot lysis. These include trials of ultrasound, microbubbles, thrombin inhibition and interventional management of stroke. He has also led MNI's efforts to expand stroke treatment to more patients through the use of telemedicine links to community hospitals throughout Texas.



Chen

**Roc Chen, M.D.**, assistant professor of neurosurgery, received his medical degree at Sun Yat-Sen University of Medical Sciences in Guangzhou, China, followed by residencies at the First Affiliated Hospital of Sun Yat-Sen University and at Brigham and Women's Hospital, Children's Hospital Boston and Harvard Medical School. He has completed fellowships in neuro-interventional radiology at Brigham and Women's Hospital, Harvard

Medical School, in cerebrovascular and skull base surgery at Barrow Neurological Institute, and in neuroendovascular surgery and cerebrovascular neurosurgery at Thomas Jefferson University Hospital. Prior to joining MNI and the UT Medical School, he was an assistant professor of neurosurgery, director of the Cerebrovascular and Neuroendovascular Program and director of the Skull Base Program at Baylor College of Medicine.

Dr. Chen's specialty interests include skull base neurosurgery, including skull base tumors and skull base neurovascular disease, and cerebrovascular disease. He has co-authored studies published in *Neurosurgery*, *BNI Quarterly*, *Neurosurgical Focus*, *Acta Neurochirurgica*, the *Journal of Neurosurgery: Spine*, the *Journal of Biological Chemistry* and the *American Journal of Physiology*, among others. He is institutional co-principal investigator of "A Randomized Multicenter Clinical Trial of Unruptured Brain Arteriovenous Malformations" (ARUBA study) and co-principal investigator for the "Albumin in Subarachnoid Hemorrhage-induced Vasospasm Trial" (ALISAH).



Johnson

An honors graduate of Yale University School of Medicine, **Michele M. Johnson, M.D.**, completed her neurosurgery residency in 2007 and a spine fellowship in 2008 at Emory University. Dr. Johnson's research has focused on spinal surgery; epilepsy, including depth electrode placement and necessity and outcomes after selective surgery without pre-operative invasive monitoring; molecular

mechanisms and genetic analysis of autoimmune lymphoproliferative syndrome; and immunotherapy for multiple sclerosis and other T cell-mediated autoimmune diseases. She is a co-author of studies that have been published in *Genetics*, the *Journal of Immunology*, the *American Journal of Neuroradiology and Science*. Dr. Johnson is available to consult on all disorders related to the spine and spinal cord.



Boone

A board-certified neurosurgeon with expertise in neurosurgical treatment of disorders of the spinal column and spinal cord, **Paul D. Boone, M.D.**, is renowned for his complex spinal reconstructive surgical techniques as well as his minimally invasive approaches to spinal conditions. Prior to joining Mischer Neurosurgical Associates, Boone was on the faculty at Vanderbilt University Medical Center, where he served as an assistant professor of neurosurgery. In 2007, Dr. Boone was nominated by his peers and elected to be included in the Best Doctors in America list, a medical resource founded by physicians affiliated with Harvard University School of Medicine. Best Doctors in America iden-

tifies specialists who are considered by fellow physicians to be the most skilled in their fields and most qualified for reviewing and treating complex medical conditions.



Shepard

**Scott R. Shepard, M.D.**, is a board-certified neurosurgeon with expertise in brain and spinal cord tumors as well as spinal and pituitary surgery. Dr. Shepard earned his medical degree from Weill Cornell Medical College in New York, N.Y., where he received several prestigious honors recognizing his outstanding scholastic performance. He completed his residency at the University of California at San Francisco, where he served as chief resident in neurosurgery. Dr. Shepard also was a research fellow at CNS Injury and Edema Center and Brain Tumor Research Center at the University of California at San Francisco. He completed his fellowship in surgical neuro-oncology at Memorial Sloan-Kettering Hospital in New York.

Prior to joining Mischer Neurosurgical Associates, Dr. Shepard was on the faculty at Robert Wood Johnson Medical School in New Brunswick, N.J., where he served as an assistant professor of neurosurgery. He has published numerous journal articles and chapters as well as presented a variety of topics in the field of neurosurgery, nationally and internationally.

UT MEDICAL SCHOOL AT HOUSTON OFFERS

# NEUROSURGERY RESIDENCY PROGRAM AT THE MISCHER NEUROSCIENCE INSTITUTE

NEUROSURGERY RESIDENTS walked through the doors of The University of Texas Medical School at Houston this summer for the first time in the history of the school.

“There’s a dire shortage of neurosurgeons throughout the country,” says Dong Kim, M.D., director of the Mischer Neuroscience Institute (MNI) at Memorial Hermann and professor and chair of the department of Neurosurgery at the UT Medical School. “We have the expert faculty in place to support a residency, and we’re the market leader in Houston in cranial neurosurgery.”

According to a study published in the February 2005 issue of the *Journal of Neurology*, the United States has experienced “a severe decline in the number of active neurosurgeons and a static supply of residents.” Approximately 60 board-certified or board-eligible neurosurgeons serve Harris County’s nearly 4 million residents, according to the Harris County Medical Society and the American Association of Neurological Surgeons.

The new residency program is one of 58 UT Medical School residencies and fellowships accredited by the Accreditation Council for Graduate Medical Education.

The Neurosurgery department at Memorial Hermann-Texas Medical Center and the UT Medical School is currently listed as No. 3 in the country in National Institutes of Health research awards.

Five new residents began their seven-year residency on July 1, training at the Mischer Neuroscience Institute, based at

Memorial Hermann-TMC and Children’s Memorial Hermann Hospital.

To qualify for accreditation of the neurosurgery residency, the school had to demonstrate that it has sufficient faculty, clinical resources, procedures, infrastructure and funding for the positions. Collaboration with other departments, such as Neurology, was also important in achieving accreditation.

“The residency program is good news for neurology, neurosurgery and all other clinical departments at the medical school,” says James Grotta, M.D., co-director of MNI and professor and chair of the department of Neurology at the UT Medical School.

The University of Texas Medical School at Houston is ranked 26th of 376 sponsoring institutions in the number of residents trained. “The neurosurgery residency legitimizes our program at MNI and will lead to even more research. With its addition, we now have a residency in every field,” Dr. Kim says.

## WELCOME NEW RESIDENTS!

### **Bart MacDonald PGY-6**

- Medical School: Medical College of Georgia
- Neurosurgical residency PGY2/3/4/5 Brigham and Women’s Hospital and Children’s Hospital Boston

### **Nirupama Kumar PGY-2**

- Medical School: Temple School of Medicine
- Surgical Internship: Columbia Presbyterian Hospital

### **Adrian Smith PGY-2**

- Medical School: Wayne State University School of Medicine
- General Surgery Internship: University of South Alabama Hospital

### **Malcolm Anthony PGY-1**

- Ph.D.: University of California, San Francisco, Cell Biology
- Medical School: University of California, San Francisco

### **Sean Meiner PGY-1**

- Medical School: The University of Texas Medical School at Houston



FOR MORE INFORMATION ABOUT THE MNI,  
CALL 713.704.0916.

# MNI HOSTS THE 2008 PRINCETON CONFERENCE

THE STROKE CENTER at Mischer Neuroscience Institute hosted the 26th Princeton Conference on Cerebrovascular Disease, held March 27 through 30 in Houston. Funded by the National Institutes of Health, the conference for stroke experts began as a biennial event first held 50 years ago at Princeton University. Since then, the conference has been held every two years at selected major stroke centers in the United States. Memorial Hermann-Texas Medical Center and The University of Texas Medical School at Houston provided additional funding for this year's conference, which drew 170 invited stroke researchers from North America.

"We were pleased to be invited to host this year's conference," says James C. Grotta, M.D., organizer of the event. Dr. Grotta is co-director of the Mischer Neuroscience Institute (MNI) at Memorial Hermann, director of MNI's Stroke Center and a professor of neurology at the UT Medical School, where he holds the Roy M. and Phyllis Gough Huffington Distinguished Chair in Neurology. "The event gave us an opportunity to highlight the successes of our stroke program and showcase our current research, which involves the development of new therapies for acute stroke patients, including clinical studies of thrombolytic drugs, hypothermia and other approaches to reducing brain damage and improving recovery following stroke."

The keynote lecture, "Suspended Animation in Non-hibernating Mammals" was delivered by Cheng Chi Lee, Ph.D., professor of biochemistry and molecular biology at the UT Medical School. Dr. Lee's lecture was preceded by an introductory talk by James T. Willerson, M.D., president, Alkek-Williams Distinguished Professor and Edward Randall III Chair in

Internal Medicine at The University of Texas Health Science Center at Houston. Dr. Willerson spoke on "Cerebrovascular Research at the UT Medical School and Stem Cell Therapy for Heart Failure." Session topics included neurovascular units, imaging and biomarkers, vascular cognitive impairment, prevention, brain hemorrhage, reperfusion, neuroprotection, rehabilitation and stem cell therapy.



# MUTATIONS IN SMOOTH MUSCLE $\delta$ -ACTIN (ACTA2) LEAD TO THORACIC AORTIC ANEURYSMS AND DISSECTIONS

Dong-Chuan Guo **1**, Hariyadarshi Pannu **1**, Van Tran-Fadulu **1**, Christina I. Papke<sup>1</sup>, Robert K. Yu **2**, Nili Avidan **1**, Scott Bourgeois **1**, Anthony L. Estrera **3**, Hazim J. Safi **3**, Elizabeth Sparks **4**, David Amor **5**, Lesley Ades **6**, Vivienne McConnell **7**, Colin E. Willoughby **8**, Dianne Abuelo **9**, Marcia Willing **10**, Richard A. Lewis **11**, Dong H. Kim **12**, Steve Scherer **13**, Poyee P. Tung **1**, Chul Ahn **1**, L. Maximilian Buja **14**, C. S. Raman **15**, Sanjay S. Shete **2**, and Dianna M. Milewicz **1**

**ABSTRACT** - The major function of vascular smooth muscle cells (SMCs) is contraction to regulate blood pressure and flow. SMC contractile force requires cyclic interactions between SMC  $\delta$ -actin (encoded by ACTA2) and the  $\beta$ -myosin heavy chain (encoded by MYH11). Here we show that missense mutations in ACTA2 are responsible for 14 percent of inherited ascending thoracic aortic aneurysms and dissections (TAAD). Structural analyses and immunofluorescence of actin filaments in SMCs derived from individuals heterozygous for ACTA2 mutations illustrate that these mutations interfere with actin filament assembly and are predicted to decrease SMC contraction. Aortic tissues from affected individuals showed aortic medial degeneration, focal areas of medial SMC hyperplasia and disarray, and stenotic arteries in the vasa vasorum due to medial SMC proliferation. These data, along with the previously reported MYH11 mutations causing familial TAAD, indicate the importance of SMC contraction in maintaining the structural integrity of the ascending aorta.

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# DRIP-AND-SHIP THROMBOLYTICS: IS THIS APPROACH SAFE TO DELIVER STANDARD-OF-CARE THERAPY FOR ACUTE ISCHEMIC STROKE?

Sheryl Martin-Schild **1**, Miriam M. Morales **1**, Aslam M. Khaja **2**, Andrew D. Barreto **1**,  
Hen Halleivi **1**, Anitha Abraham **1**, M. Rick Sline **1**, James C. Grotta **1**, Sean I. Savitz **1**

**BACKGROUND** - Tissue plasminogen activator within three hours of symptom onset remains the only proven treatment for acute ischemic stroke (AIS), yet national rates of tPA use among eligible patients remain < 5 percent. Many small hospitals are reluctant to treat with tPA unless the patients can be rapidly transferred to stroke centers for post-lytic care. While this approach has been shown to increase tPA delivery, safety and liability remain concerns. Our stroke center serves as a hub for emergency departments covering a radius of more than 100 miles.

**METHODS** - From our prospective stroke registry, we identified patients over the past 3.5 years who presented to outside hospitals (OSH) with acute stroke symptoms, were treated with tPA after consultation with our stroke team, and then transferred for further care. We compared the baseline demographics, NIHSS, onset-to-needle and door-to-needle times, adverse events (sICH, PH2, and neurological deterioration), and early outcomes (discharge mRS and disposition) of drip-and-ship patients with patients treated within three hours of onset with IV tPA in our Emergency Center. Pearson's Chi-Square (for categorical measures) and t-Test (for continuous measures) explored potential differences between transfer patients and patients treated at our Stroke Center.

**RESULTS** - We accepted 93 patients after treatment with IV tPA at outside hospitals. Only 67 (72 percent) were treated within three hours of onset. When these patients treated within three hours were compared with the 319 patients treated directly at our institution over the same period, we found no difference in age or gender, but a significantly higher proportion of transfers were white. The baseline NIHSS was lower in patients treated at OSH ( $p=0.043$ ). The door-to-needle time was significantly prolonged at OSH ( $p<0.0001$ ), but there was no difference in adverse events. Patients treated at OSH had a trend to more favorable early outcomes. The inclusion of patients treated beyond three hours at OSH yielded a mean onset-to-needle time of 160 minutes, which did not affect the incidence of adverse events or good outcomes (mRS 0-1).

**DISCUSSION** - The drip-and-ship strategy for delivering standard of care for AIS has similar safety profiles and discharge outcomes compared with patients treated at our institution. This approach likely increases the number of treated patients, which translates into improved outcome. The trend to higher rate of good outcomes in the transfer population may be due to lower baseline NIHSS scores.

**1** The University of Texas Health Science Center at Houston, Houston, Texas; **2** University of Illinois at Chicago, Chicago, Illinois.



Physician services provided by UT Physicians.

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