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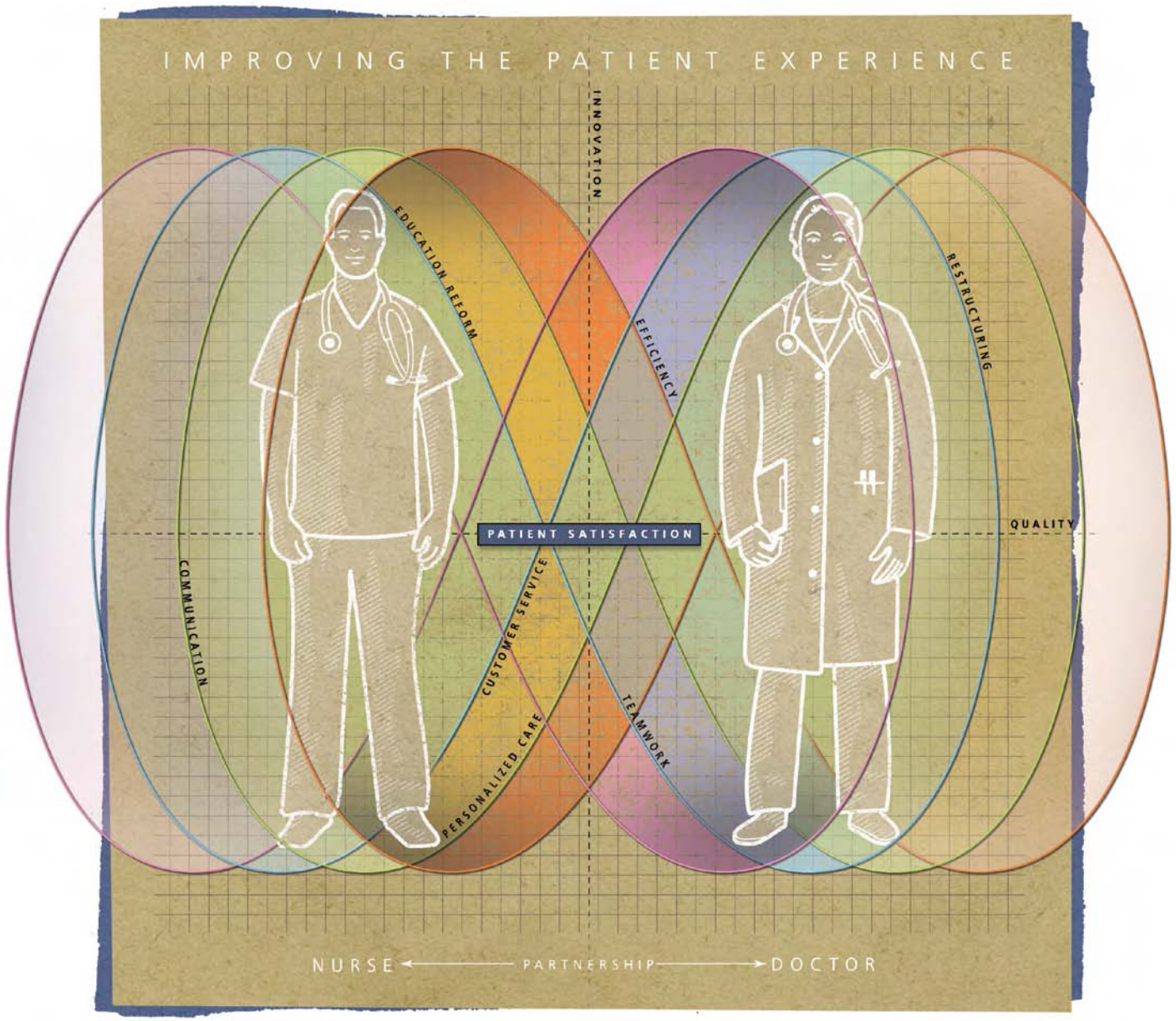
MEMORIAL HERMANN

MISCHER NEUROSCIENCE INSTITUTE

JOURNAL

A PUBLICATION FROM MEMORIAL HERMANN-TEXAS MEDICAL CENTER AND THE UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER AT HOUSTON (UTHEALTH) MEDICAL SCHOOL



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In This Issue

Neuroscience Care *at the* Intersection *of* Quality *and* Innovation

Quality aims for continuously higher performance in meeting existing standards; innovation aims for breakthroughs. Both concepts become reality through an ongoing commitment to positive change. At the Mischer Neuroscience Institute, we believe in making tomorrow better than today by delivering care at the point where quality and innovation intersect.

We'd like to congratulate our nursing team, whose self-driven customer service and quality improvement initiatives have led to a dramatic upswing in our patient satisfaction scores. In our cover story, you'll learn how our nurses partner with physicians to improve the patient experience. By restructuring MNI's nursing care delivery model, we've become faster and more nimble in our response to our patients' needs and desires. Our entire nursing team is focused on delivering very personalized service at the bedside.

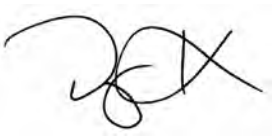
"AT THE MISCHER NEUROSCIENCE INSTITUTE, WE BELIEVE IN MAKING TOMORROW BETTER THAN TODAY BY DELIVERING CARE AT THE POINT WHERE QUALITY AND INNOVATION INTERSECT."

A special thanks to Johnny and Trudy Wilson for sharing their personal story in this issue of the journal. Mr. Wilson is one of countless stroke patients who have benefited from our Telemedicine Program, which is building a collaborative network of hospitals working together to deliver comprehensive neurological and neurosurgical care to Texans. A resident of Orange, Texas, Mr. Wilson was taken to Baptist Beaumont Hospital, a member of our telemedicine network since 2002. Thanks to its partnership with MNI, the community hospital has been accredited as a primary stroke center since 2007 and has morphed into a local powerhouse for the delivery of tPA.

In this issue, you'll read about a new diagnostic tool that enables physicians – for the first time in history – to diagnose Alzheimer's disease. Amyloid imaging uses an FDA-approved agent called Amyvid™ that binds to abnormal proteins in the brain, allowing physicians to visualize the protein on a PET scan. MNI is the first in Houston to offer the screening tool, which will give researchers insights into how they might one day prevent Alzheimer's disease.

This September, after raising $70 million in the quiet phase, we went public with a collaborative $100 million fundraising initiative to advance the field of neuroscience research and clinical care. We launched the "Revolutionizing Neuroscience" campaign to ensure the position of Memorial Hermann and The University of Texas Health Science Center at Houston (UTHealth) Medical School as local, national and international leaders in neuroscience. We hope you'll join us as we work to achieve our goals.

With best wishes,



DONG H. KIM, M.D.

Director, Mischer Neuroscience Institute at Memorial Hermann

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Mischer Neuroscience Institute's Nursing Team Drives Quality Improvements

Empowering nurses at the bedside to provide good customer service and implement quality improvement initiatives has led to a dramatic upswing in patient satisfaction scores at the Mischer Neuroscience Institute (MNI).

"Over the years, patient acuity and the demands on nursing have increased. At the same time, nurses are working 12-hour shifts two to three days a week, which means patients have multiple nurses during their hospitalization," says Nicole Harrison, R.N., administrative director of nursing at MNI. "When a nurse comes to work and assumes care of a patient for the first time, there is much to learn. Patients have more complex medical histories to review and understand, so nurses have to hit the ground running. We wanted to provide greater consistency for our patients so we restructured the neuroscience nursing team to focus more strongly on quality and customer service. By doing so, we've improved the overall patient experience."

"WE WANTED TO PROVIDE GREATER CONSISTENCY FOR OUR PATIENTS, SO WE RESTRUCTURED THE NEUROSCIENCE NURSING TEAM TO FOCUS MORE STRONGLY ON QUALITY AND CUSTOMER SERVICE. BY DOING SO, WE'VE IMPROVED THE OVERALL PATIENT EXPERIENCE."

That improvement is reflected in MNI's HCAHPS scores, which have moved from "below target" to "distinguished" in five of the eight areas tracked, including overall rating, communication about new medication, hospital environment, responsiveness of hospital staff and communication with physicians. HCAHPS (Hospital Consumer Assessment of Healthcare Providers and Systems), a standardized survey instrument and data collection methodology that allows valid comparisons to be made of hospitals across the country, is the first national, publicly reported survey for measuring patients' perceptions of their hospital experience.

Harrison has led the nursing initiative to improve the patient experience since joining MNI at the end of October 2011. "We redesigned our structure to give our nurses more support at the bedside and in doing so, we created a solid platform for the launch of our quality and customer service initiatives," she says. "Our nurses are in charge, and they drive the unit. They're involved in decision-making through committees and one-on-one meetings with directors. We've made it clear – from the top down – that nurses are valued and equal members of the patient care team. As the people who care for our patients day in and day out, they're aware of patient and family concerns, and they notice the smallest changes in the patient's condition, which is especially important after a neurological event. They make a vital contribution to the physicians' knowledge of their patients by participating in daily rounds."

Harrison and her team have moved away from the traditional nursing model that gives one charge nurse responsibility for the flow of an entire unit, including bed assignment, patient throughput, staffing issues, quality and peer-to-peer support at the bedside. "With the multitude of important, necessary functions of the traditional charge nurse role, it was evident that our charge nurses didn't have the time to devote to each of these details," she says. "We started by taking a hard look at where we were focusing our energy. We have 39 beds on the neuroscience unit. On a typical day, between 11 and 15 patients are discharged or admitted – a high number. We knew we were busy, but we started wondering if the energy we were expending was really making a difference in quality and patient satisfaction. So rather than adding staff, we restructured for more efficiency."

Stroke is a sudden change in physical being. When patients first arrive on the unit, family and friends are concerned and anxious. The small things our nurses do to provide personalized care make a difference.

Alex Choi, M.D., assistant professor in the Department of Neurology and the Vivian L. Smith Department of Neurosurgery, rounds with nurses using one of MNI's computers on wheels (COWs) to view patient charts.

The new structure includes an operational leader responsible for bed assignment, timely discharge and admission, staffing, patient flow and work flow – and two team leaders, who split the unit in half and focus on the quality and customer service portion of patient care. They share responsibility for rounding on each patient and looking at specific patient satisfaction measures using an audit tool designed by the nursing team based on HCAHPS survey questions.

"The new structure allows us to offer very personalized service," says Odun Atunrase, R.N., team leader on the neuroscience unit. "When we round, we ask if patients and family members have any questions or concerns. We check to make sure that pain is controlled, and we ask if the nursing staff has been responsive to their needs. We review the plan of care to ensure that the patient and family understand what to expect. We make an official round of the room, checking for cleanliness and ensuring that all items in the room are well stocked. We discuss the plan of care for the day with the patient and family and with the bedside nurse. If there are any concerns, we take care of them on the spot. We want to make sure that all our patients' needs and expectations are met."

Team leaders are also available to assist bedside nurses. "Much of our work is focused on freeing up the charge nurse so that she can spend more quality time with nurses on her shift," Atunrase says. "We round with the physicians and nurses, and when rounds are finished, we're available to start IVs or provide whatever assistance the bedside nurse needs."

Stroke Unit charge nurse Shanequa Sostand, R.N., values the support team leaders provide. She also stresses the importance of nurse collaboration with the physician team and the value of personal attention for neuroscience patients. "Stroke is a sudden change in physical being," Sostand says. "When patients first arrive on the unit, family and friends are concerned and anxious. There are a lot of unknowns, and they're worried that their loved one won't recover. At a time like this, small things really make a difference."

Those small things include very personal attention reinforced by the audit tool. Christine Glendening, R.N., and Jessica Haines, R.N., co-chair the customer service initiative for the 32-bed Neuroscience Intensive Care Unit. "Our customer service team includes about 30 nurses – all volunteers – who want to make a difference on the unit and improve customer service," Glendening says. "We started by examining our HCAHPS scores from July 2011 through February 2012 to look for areas of opportunity. Based on that, we created a customer service audit binder that includes an audit survey and questions similar to those asked on the HCAHPS survey. It's straightforward and basic, and lets us know if they have any concerns."

"WHEN PATIENTS FIRST ARRIVE ON THE UNIT, FAMILY AND FRIENDS ARE CONCERNED AND ANXIOUS. THERE ARE A LOT OF UNKNOWNS, AND THEY'RE WORRIED THAT THEIR LOVED ONE WON'T RECOVER. AT A TIME LIKE THIS, SMALL THINGS REALLY MAKE A DIFFERENCE."

Haines says she finds the customer service initiative rewarding. "It creates a better experience for our patients and families. They're going through a very difficult time in their lives. As busy nurses, it's easy for us to get caught up in numbers and forget that we're dealing with people who are just like us. This is about getting back to the basics of courtesy and real caring. We have a great unit and a lot of really dedicated nurses who want to do what's best for the patient. And our patients love it."

Janete Sheiner, R.N., A.P.R.N., C.C.R.N., interim NIMU supervisor, has chaired the Ventilator-Associated Pneumonia (VAP) Committee since September 2011, leading an initiative that has reduced VAP rates in the Neuroscience ICU. "A review of past data showed that we were reporting between six and seven VAP infections a month," she says. "We implemented evidence-based VAP guidelines from the Institute of Health Improvement. We also scheduled monthly meetings with staff and recruited more members to the VAP Committee and educated them about our initiatives, which helps improve compliance."

By February 2012, VAPs had been reduced to two and in March, the number of infections dropped to zero. "The bedside nurse and respiratory therapist are the key people involved in preventing ventilator-associated pneumonia," Sheiner says. "Once we involved the key players and began evidence-based practice, we saw a tremendous improvement."

A third initiative focuses on follow-up. "If you don't follow up, people tend to forget," Sheiner says. "We implemented a daily audit that involves all VAP Committee members. They go from room to room with a checklist that includes the Institute of Health Improvement evidence-based guidelines. If we find that something is missing, we reeducate the bedside nurse. We've found that it's more effective to do audits on a daily basis."

Sheiner says MNI's leadership team is very supportive of nursing quality initiatives. "We're showing that nurses have an enormous impact on the care a patient receives because they're there every day. Dr. Kim and Dr. Grotta empower nurses to take ownership of patient care at the bedside," she says. "If we notice any deviation from the plan of care, they want us to speak up. They want to make sure we're doing the right thing for our patients."

Dong Kim, M.D., director of MNI and professor and chair of the Vivian L. Smith Department of Neurosurgery at The University of Texas Health Science Center at Houston (UTHealth) Medical School, believes in forging a strong physician partnership with nurses. "Part of empowering nurses is encouraging them to think about what's not working well," Dr. Kim says. "We want them to share their ideas about transforming care at the bedside with us. How can we improve the flow in the work environment? No one knows our patients better than the people working at the bedside. We also encourage them to be engaged in evidence-based research and to achieve certification in their discipline. We want them to help us continue to improve."

To ensure that new recruits have a solid foundation in neuroscience and are well equipped to work independently, Nicole Harrison and her team have created a new nurse education structure. Rather than reporting through the hospital's Education department, three neuroscience educators report to her.

"Making the education model neuroscience-specific allows us to focus on our service line, which will help us continue to improve quality," Harrison says. "We fill open positions through the MNI Nursing Academy using a model similar to a residency or internship, with the exception that the speed at which nurses advance through the academy is personalized to the individual. Some have experience, and others are new to nursing. Everything in our program is oriented to the patient. For instance, Nursing Academy members watch surgery in the OR. We've found that you're more sympathetic to the patients when they have pain if you've seen the surgery."

"Changing a culture takes time," says James Grotta, M.D., co-director of MNI and professor and chair of the department of Neurology at the UTHealth Medical School. "In a short time, we've done a good job of getting the right people in the right roles. Leadership is so important to drive the shift to quality outcomes. We want leaders who empower our bedside nurses and help us grow professional nursing within our service line. Building a good foundation of nurses with expertise in neuroscience and retaining them is one of our critical success factors. It's a work in progress, and data show that the work is driving improved quality."

MNI Offers Groundbreaking Test for Detection of Alzheimer's Disease

The Mischer Neuroscience Institute (MNI) is the first in Houston to offer a new diagnostic tool that enables physicians to diagnose Alzheimer's disease, and will give researchers insights into how they might one day prevent the disorder. The screening tool, known as amyloid imaging, uses an agent called Amyvid™ (florbetapir F 18 injection), which was approved in April 2012 by the Food and Drug Administration.

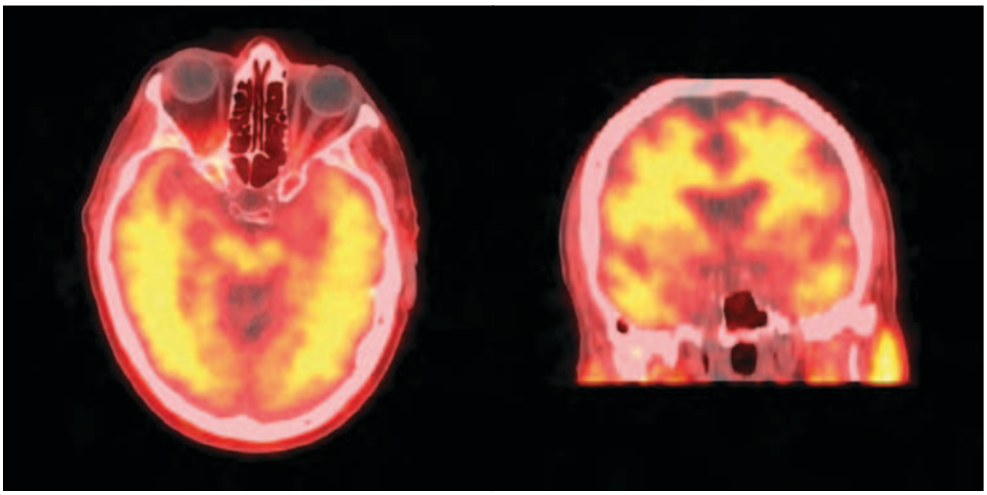
"Physicians and researchers have been searching for years for clues about how to diagnose Alzheimer's disease," says Paul Schulz, M.D., a neurologist affiliated with MNI, associate professor and vice chair of the department of Neurology and director of the Dementia Program at The University of Texas Health Science Center at Houston (UTHealth) Medical School. "Amyvid is an exciting breakthrough – a radioactive agent that binds to amyloid proteins in the brain, a hallmark of Alzheimer's disease, and allows them to be visualized on a PET scan."

Administered intravenously in the patient's arm, Amyvid tracked on a PET scan can reveal beta-amyloid neuritic plaque density in the brains of patients with cognitive impairment. Beta-amyloid protein forms in amyloid plaques – abnormal clumps of brain cells mixed with the protein – in patients with Alzheimer's disease and related cognitive disorders. According to the FDA, a negative scan reduces the likelihood that cognitive impairment is due to Alzheimer's disease. A positive scan may indicate the presence of Alzheimer's disease, but beta-amyloid protein may also be present in older people with normal cognition.

To date, Dr. Schulz has used the new screening tool to test three patients, all of whom he diagnosed with Alzheimer's disease. "Until the advent of this test, we couldn't definitively diagnose the disease," he says. "As a result, patients and their families often suffered the agony of not knowing whether they had a disorder that could be arrested, such as stroke-related dementia, or reversed, such as depression, versus Alzheimer's disease, which cannot yet be arrested. In addition, patients may have been given unnecessary treatments because it was unclear whether they had Alzheimer's disease. Alzheimer's is not a wonderful diagnosis to receive, but if we know a patient has it, we can begin treatment earlier and family members can make important personal and business decisions."

Treatments for Alzheimer's include cholinesterase inhibitors that reduce symptoms and appear to positively affect the course of the disease, and the NMDA receptor antagonist Namenda (memantine), which decreases abnormal activity in the brain and improves cognition. "An earlier diagnosis of Alzheimer's will allow us to start medication before significant brain destruction occurs," Dr. Schulz says. "In addition to overcoming the challenge of diagnosis, Amyvid opens new doors to research. It's generally accepted that treatments for Alzheimer's will be much more effective when introduced prior to the onset of symptoms. Until now, researchers had no way to study new, potentially preventive treatments because we had no way of knowing who would develop it."

As a neurologist who has been treating patients with Alzheimer's disease for 25 years, Dr. Schulz finds amyloid imaging a very exciting screening tool. "Until now, the content of beta-amyloid in the brain could only be determined by brain biopsy or examination of the brain at autopsy," he says. "Because Alzheimer's is projected to affect more than 100 million people worldwide by 2050, the capability to diagnosis the disease is crucial. People begin laying down amyloid 20 to 30 years before they actually have Alzheimer's disease. If we can use the screening tool on 50 year olds who have several risk factors for Alzheimer's disease – a family history, past head trauma, post-traumatic stress disorder or any of the risk factors for stroke – and find amyloid, we can investigate treatment earlier and perhaps prevent full-blown manifestation of the disease. After years of having to guess, this is like handing us a crystal ball."



Using a radioactive agent that binds to amyloid proteins in the brain, PET scans reveal the presence of Alzheimer's disease.

Dr. RSVP *and the* Miracle Man

Telemedicine Extends Neuroscience Expertise to the Community

Before Baptist Beaumont Hospital joined the Mischer Neuroscience Institute's (MNI) Telemedicine Program in 2002, there were no acute care hospitals equipped to treat ischemic stroke between Houston, Texas, and Lake Charles, Louisiana. The two cities lie 132 miles apart in the southwest tip of the Stroke Belt, an area of the southeastern United States with an unusually high incidence of stroke and other forms of cardiovascular disease. With only a handful of neurologists available to provide on-call coverage for a 75- to 100-mile service area, the hospital was ill equipped to provide care for the area's older population. But thanks to telemedicine and its partnership with MNI, Baptist Beaumont Hospital has been accredited as a Primary Stroke Center since 2007 and has morphed into a local powerhouse for the delivery of tPA.

"The average age of our stroke patients is 62, which is very young," says Donna Biscamp, R.N., C.E.N., an emergency department nurse who serves as the hospital's stroke coordinator. "Because of our telemedicine program and the physicians at the Mischer Neuroscience Institute, we've been able to deliver tPA at high rates. As a result, many of our former patients who would otherwise be in nursing homes are walking, talking and living active lives."

Biscamp, who began collecting data in 2007, is enthusiastic about the stroke program's growth. "In 2007, 202 patients presented with stroke, and we were able to administer tPA to 12 patients, or 6 percent," she says. "By 2011, our program had more than doubled in size. We saw 434 stroke patients, 50 of whom received tPA. Those numbers translate to lives and quality of life saved."

Among those who have benefited is 65-year-old Orange, Texas, resident, Johnny Wilson, who, while helping dress his grandchildren last March, became dizzy and started vomiting. His wife Trudy Wilson caught him as he fell, and eased him to the ground.

THANKS TO TELEMEDICINE AND ITS PARTNERSHIP WITH MNI, BAPTIST BEAUMONT HOSPITAL HAS BEEN ACCREDITED AS A PRIMARY STROKE CENTER SINCE 2007 AND HAS MORPHED INTO A LOCAL POWERHOUSE FOR THE DELIVERY OF TPA.

"When I saw Johnny's mouth drawing to the right and his right arm going limp, I knew he was having a stroke," she recalls. "I'd heard good things about Baptist Beaumont Hospital – a friend's mother was treated for stroke there. An ambulance happened to be parked at the nursing home just across the street from us, and I asked them to take Johnny to Baptist Beaumont. I followed in my car, and by the time I got to the emergency center, they'd done a CT scan and had Johnny in a room with computers and a lady on the screen. She was examining him remotely. It was amazing!"

The physician on the screen was Nicole R. Gonzales, M.D., an assistant professor of neurology at The University of Texas Health Science Center at Houston (UTHealth) Medical School, who was on call for telemedicine at MNI. From her laptop control screen, Dr. Gonzales had logged on to Memorial Hermann-Texas Medical Center's RP-Lite™ Remote Presence Robotic System, a teleconferencing technology that links the MNI Stroke Center to nine outlying facilities. Pioneered by InTouch Health, the RP-Lite system is a robot that can be remotely maneuvered by the stroke team member on call. Equipped with two-way video capability, it allows physicians to consult with specialists, see patients and view monitors and other clinical data sources firsthand from remote locations.

When Dr. Gonzales activated her computer, the emergency staff in Beaumont directed their remote presence robot – nicknamed Dr. RSVP for Rapid Stroke Virtual Presence – toward Wilson, allowing physician and patient to view each other on the screen and talk. Dr. Gonzales could see Wilson's facial droop, and he demonstrated right-side weakness. Based on his CT results, the physical exam conducted by emergency physician Loc Nguyen, M.D., and her observations via computer, Dr. Gonzales determined that he would be a good candidate for tPA. When the tPA had no effect, Wilson was transported by Memorial Hermann Life Flight® to the Mischer Neuroscience Institute, where a CT angiogram of the brain showed a basilar artery occlusion.

At MNI, Wilson was treated by neurointerventionalist Roc Chen, M.D., an assistant professor in the Vivian L. Smith Department of Neurosurgery at the UTHealth Medical School, who used an endovascular technique to open the artery. "We navigated a special catheter and device to remove the clot through the femoral artery in the groin to the aorta to the vertebral artery in the neck, which is the main trunk for the basilar artery," Dr. Chen says. "We were able to remove the clot in time and completely open the basilar artery and its occluded branches. Ultimately, he did quite well."

Wilson was transferred to TIRR Memorial Hermann for inpatient rehabilitation at the end of March and discharged in late April. He continued his therapy

at TIRR Memorial Hermann Adult and Pediatric Outpatient Rehabilitation in southwest Houston.

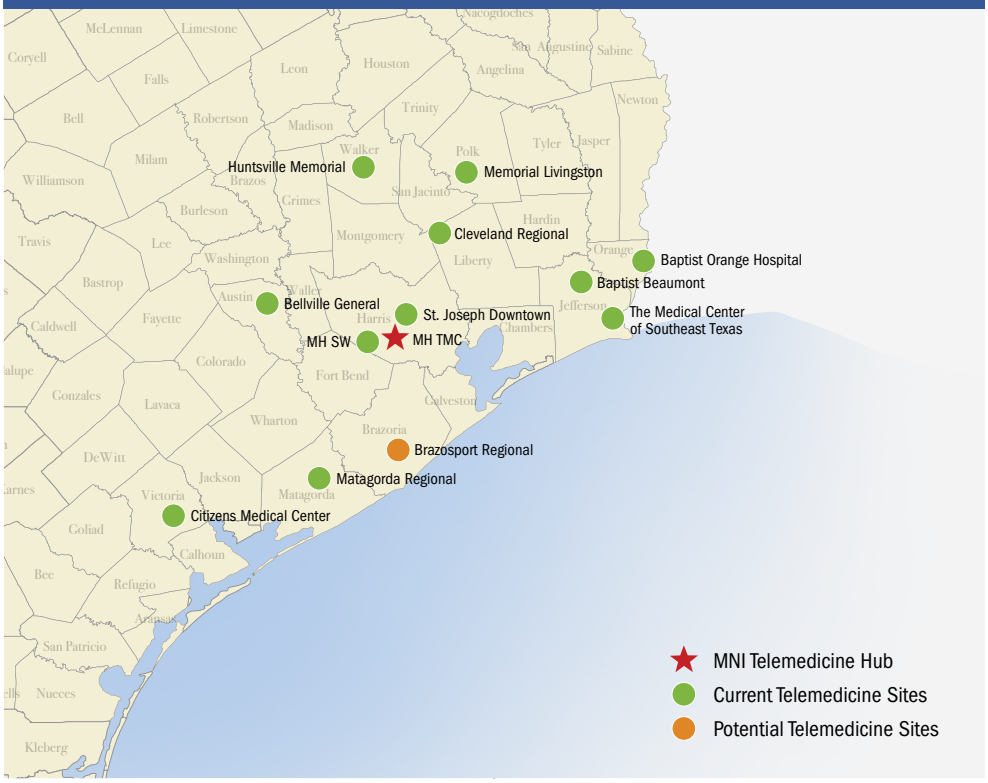
"Telemedicine saved Johnny's life," Trudy Wilson says. "Everyone calls him the Miracle Man because of the size and nature of his stroke. The doctors and nurses who treated him knew exactly what was happening to him and what needed to be done. I think telemedicine is the best technology ever designed."

Baptist Beaumont Hospital and Memorial Hermann Southwest Hospital were early adopters of telemedicine. Eight other hospitals in Southeast Texas went live with the technology in 2012: Huntsville Memorial Hospital, Bellville General Hospital, Matagorda Regional Medical Center, Memorial Livingston Hospital, Cleveland Regional Medical Center, Baptist Orange Hospital, the Medical Center of Southeast Texas in Port Arthur, and St. Joseph Hospital-Downtown in Houston.

"Our ultimate goal is to build a collaborative network of hospitals working together to deliver comprehensive neurological and neurosurgical care in the South Texas region," says Tzu-Ching (Teddy) Wu, M.D., medical director of MNI's Telemedicine Program. "As the Texas Medical Center hub, MNI provides 24/7 stroke consultations, as well as consults for other conditions, for our network hospitals. The program allows us to treat as many patients as possible at our partner hospitals, avoiding unnecessary patient transfers."

In addition to access to physicians who are experts at neuroscience care for telemedicine consultation, benefits to hospitals in the telemedicine network include higher quality of care and decreased treatment delays as patients receive prompt diagnosis with a treatment plan based on the best available protocols. "More patients and families receive treatment where they live, in the community, rather than having to drive long distances to Houston," Dr. Wu says. "Patients who require a higher level of care have a guaranteed transfer process that gives them access to the most advanced treatments and the best tertiary-care neuroscience partner in the region."

MNI TELEMEDICINE PRESENCE



Dr. Wu sees excitement among emergency department physicians and nurses as they collaborate with MNI on treatment protocols and plans, continue their education about stroke and expand their knowledge of evidence-based neurological care. "We work closely with the emergency department director and stroke coordinator at each hospital in the network to ensure that we're delivering the highest quality acute neurological care," he says. "Having specialists and subspecialists to rely on helps build confidence in their own practice environment. We also work with local EMS providers to help extend access throughout the community."

Donna Biscamp is proud of the stroke program at Baptist Beaumont Hospital. "We've worked hard to fine-tune our program, and we pride ourselves on the fact that it's nurse-driven," she says. "When a stroke patient comes in, we're very fast at initiating treatment. They're evaluated by CT immediately and examined by a physician who puts the call in to the stroke team in Houston. Close teamwork between all of us – far and near – is the key to our success. Time lost is brain lost, and many of our patients wait until the last minute to see us. Telemedicine has helped us keep many patients here at the hospital, and those who need a higher level of care are Life-Flighted immediately to Houston."

Dr. Wu believes telemedicine is part of an emerging trend in healthcare to bring doctors to their patients. "Telemedicine has taught us that you don't need a major medical center to provide good stroke care," he says. "What you do need is an expert physician and a strong telemedicine program. We can now offer patients in outlying communities an opportunity to participate in clinical trials that would otherwise be unavailable to them, which helps the entire medical community by expanding knowledge. In the future we hope to move beyond stroke to offer multiple services from MNI's telemedicine center. We think the possibilities are virtually limitless."

Revolutionizing Neuroscience

Memorial Hermann and UTHealth Medical School Launch a Campaign to Advance the Field of Neuroscience

For more than 40 years, Memorial Hermann-Texas Medical Center and The University of Texas Health Science Center at Houston (UTHealth) Medical School have partnered to provide comprehensive neuroscience healthcare to the Greater Houston metropolitan area. In 2010, the two institutions came together to launch a collaborative $100 million fundraising campaign – Revolutionizing Neuroscience – to advance neuroscience research and clinical care. In September, after raising $70 million during a quiet phase, the two institutions formally announced the launch of the public campaign.

TO DATE, MEMORIAL HERMANN AND UTHEALTH MEDICAL SCHOOL HAVE INVESTED MORE THAN $100 MILLION TO PROVIDE THE FRAMEWORK FOR THEIR NEUROSCIENCE PROGRAM WITH A PRIMARY FOCUS ON RESEARCH, ADVANCED TECHNOLOGY AND PHYSICIAN RECRUITMENT IN BOTH ADULT AND PEDIATRIC NEUROSCIENCE.

"Our goal is straightforward and bold," says Dong Kim, M.D., director of the Mischer Neuroscience Institute (MNI) at Memorial Hermann and professor and chair of the Vivian L. Smith Department of Neurosurgery at the UTHealth Medical School. "Together, we're developing a world-class research program and at the same time providing exceptional, comprehensive neurological clinical care for the people of Houston and surrounding cities. We're unique in our close collaboration between the clinicians who care for patients and scientists who work in the laboratory. Our complete focus is on improving people's lives."

To date, Memorial Hermann and UTHealth Medical School have invested more than $100 million to provide the framework for the neuroscience program with a primary focus on research, advanced technology and physician recruitment in both adult and pediatric neuroscience. "Philanthropic support for our priorities in these areas will guarantee that the best care in the world is available here in Houston for people of all ages," says Ileana Treviño, CEO of the Memorial Hermann Foundation. "It's hard to find anyone who has not been directly or indirectly affected by a neurological illness or injury, and each year more people are affected by neurological conditions, from birth defects to Parkinson's disease. Philanthropic support will encourage medical advances through research and also promote excellence in the education of young physicians."

Priorities for the Revolutionizing Neuroscience campaign include $19 million to advance neurology, $10 million for neurosurgery, $10 million for the Staman Ogilvie Fund, $8.5 million for specialty care in the community, $11.5 million for neurotrauma, $15 million for rehabilitation and $25 million for pediatric neuroscience.

Neurology

The Mischer Neuroscience Institute's stroke service, led by internationally renowned stroke expert James C. Grotta, M.D., is the only program in Houston selected by the National Institutes of Health to develop and test new stroke therapies. Among those treatments is the use of tPA for acute ischemic stroke; MNI was the first center in Houston and one of the first in the United States to administer this therapy.

"The Neuroscience campaign will help support stroke research studies under way at MNI, including the use of ultrasound, new anticoagulants or hypothermia to augment the effect of tPA," says Dr. Grotta, who is co-director of MNI and professor and chair of the department of Neurology at the UTHealth Medical School. "We've already shown that these

FOR MORE INFORMATION ABOUT THE CAMPAIGN, VISIT REVOLUTIONIZINGNEUROSCIENCE.ORG.

approaches can safely double the rate at which we can open arteries during the first hours after a stroke.

"Another major focus of our research is to improve recovery from stroke," Dr. Grotta says. "My colleague Dr. Sean Savitz has already completed a pilot study of stem cells derived from the patients' own bone marrow, showing that this treatment is feasible and safe. Finally, campaign funds help support the use of telemedicine to assist us in the delivery of emergency stroke care to patients living outside the city, who are transported to regional hospitals that do not have onsite stroke expertise."

MNI is also known for clinical expertise and research in epilepsy, multiple sclerosis and other neurological diseases. The Texas Comprehensive Epilepsy Program is the leading program in the southwestern United States for the diagnosis and treatment of patients of all ages with seizures and epilepsy. Current research focuses on brain mapping of seizure foci to identify patients who may benefit from surgical treatment.

The Institute is the North American leader in studies of primary progressive multiple sclerosis led by internationally acclaimed expert Jerry Wolinsky, M.D., who is the Bartels Family and Opal C. Rankin Professor of Neurology at the UTHealth Medical School and director of the Multiple Sclerosis Research Group. Currently, neuroscience campaign funds are being used to study the relation of MS to the narrowing of veins draining blood from the brain and spinal cord. The Mitchell Center for Alzheimer's Disease Research, led by distinguished researcher Claudio Soto, Ph.D., professor of neurology, focuses on the causes and treatment of Alzheimer's disease and other degenerative disorders, including Parkinson's disease, and MNI's clinical neurodegenerative disease group led by Mya Schiess, M.D., William Ondo, M.D., and Paul Schulz, M.D., is leading several clinical research studies for these conditions.

Rehabilitation is essential to regaining function, mobility, independence and quality of life for people who have suffered a neurological disease or brain injury. At TIRR Memorial Hermann, inpatients benefit from state-of-the-art body-weight supported treadmill training.

Neurosurgery

Innovative surgical techniques that were once unimaginable are now routinely used at MNI in the treatment of patients with aneurysms, brain tumors and spinal cord injuries. Led by Dr. Dong Kim, MNI's neurosurgical team uses groundbreaking technology, including the minimally invasive Leksell Gamma Knife®, to treat brain tumors and other neurological disorders. Minimally invasive surgical procedures allow patients to recover faster and return to work, family and daily activities quicker than traditional open surgical procedures.

The neurosurgery group is an international leader in conducting clinical trials in human patients to improve outcomes. Centers of excellence include neurosurgical treatments for brain aneurysm and AVM treatment, neuro-oncology and Brain Tumor Center, spine and spinal cord disorders and injury, epilepsy and Parkinson's management, neurocritical care and procedures for stroke prevention.

The Staman Ogilvie Fund

In June 2009, Staman Ogilvie was making his last training ride before heading to Aspen for a few weeks of biking at high altitudes. After riding 12 miles on a neighborhood loop, he crashed into the back of a water truck and sustained a severe spinal cord injury. Ogilvie used his experience to benefit others by establishing the Staman Ogilvie Fund for Spinal Cord Injury Recovery, Rehabilitation and Research. The fund's mission is to aid individuals who have suffered a spinal cord or brain injury, or neurological disorders that traumatically disrupt their lives, by providing funds for leading-edge research in regenerative medicine and adaptive technology.

Specialty Care in the Community

Memorial Hermann and UTHealth Medical School have set a goal of providing innovative treatment for patients as close to their homes as possible. The plan includes the extension of services to Memorial Hermann's hospitals and specialty care facilities outside the Texas Medical Center, creating the most comprehensive network of neuroscience care in Southeast Texas.

Neurotrauma

Memorial Hermann-Texas Medical Center runs the Texas Trauma Institute, one of the nation's busiest adult and pediatric Level I trauma centers. Here, affiliated physicians provide innovative treatment following best-practice clinical protocols for people with traumatic brain injury and spinal cord injury. Memorial Hermann and UTHealth Medical School are the only institutions in the Gulf Coast area to provide a full continuum of care from Level I trauma through inpatient and outpatient rehabilitation at TIRR Memorial Hermann.

Rehabilitation

"By responding quickly to neurotrauma and delivering world-class rehabilitation, we're not only treating patients, we're transforming lives interrupted by injury," says Carl Josehart, CEO of TIRR Memorial Hermann. "At TIRR Memorial Hermann, we believe strongly in the power of the human spirit. We're dedicated to helping patients reclaim their lives, and to conducting research that improves the quality of their lives. Our physicians and researchers work closely together daily to unravel the mysteries of the brain and nervous system."

Rehabilitation is essential to regaining function, mobility, independence and quality of life for individuals who have suffered a neurological disease or brain injury. Memorial Hermann's team of dedicated healthcare practitioners designs and delivers treatment that fits each patient's unique condition. The continuum of rehabilitation care includes inpatient and outpatient rehabilitation at Memorial Hermann-TMC and TIRR Memorial Hermann, a nationally recognized rehabilitation hospital.

Pediatric Neuroscience

At Children's Memorial Hermann Hospital, a team approach combines the expertise of pediatric specialists and subspecialists to ensure that young patients receive coordinated, evidence-based care. Affiliated physicians, researchers and healthcare professionals diagnose and treat a broad range of neurological disorders, including epilepsy, brain tumors, spina bifida, mitochondrial disease, Chiari malformation and tuberous sclerosis complex. The team at UTHealth's Children's Learning Institute includes experts in the field of child development, including autism and learning differences.

Working Together to Make Breakthroughs

Memorial Hermann operates the only program in Houston offering the full continuum of care from trauma care to rehabilitation for pediatric and adult patients. The Mischer Neuroscience Institute is the largest provider of neuroscience care in the southern half of Texas, conducting more research than any other center in the south or southwestern United States through multicenter and single-center clinical trials that improve treatments for patients who cannot be treated elsewhere.

"By working closely together, Memorial Hermann and UTHealth Medical School are turning possibility into reality," Dr. Grotta says. "Every single one of our researchers and clinicians is driven by an insatiable curiosity. It's this mindset that allows us to continuously make neurological breakthroughs. Every day that we come to work, we know that we're not only changing neuroscience but most importantly, we're changing lives."

Revolutionizing Neuroscience at a Glance

Revolutionizing Neuroscience is a unique, collaborative $100 million fundraising initiative to advance the field of neuroscience research and clinical care, ensuring the position of Memorial Hermann and The University of Texas Health Science Center at Houston (UTHealth) Medical School as a local, national and international leader in neuroscience.

PEOPLE: At the heart of every great program are its people. Attracting experienced researchers and top-flight clinical specialists to work in collaboration with the talented team already assembled will create new programs and further strengthen research to provide more options and better outcomes for patients.

TECHNOLOGY: From telemedicine robots to magnetic sensors that can treat epilepsy, brain tumors and aneurysms, Memorial Hermann and UTHealth Medical School put technological advances to work to further patient care. Advanced technology ensures that specialists have the full complement of equipment to treat patients across the spectrum of neurological care.

INFRASTRUCTURE: Projects identified for support as part of the Revolutionizing Neuroscience campaign include expansion and enhancement to accommodate the complex technology that has become synonymous with modern medical care. New facilities will give physicians, nurses, technicians and researchers the space to provide even more effective care in a healing environment.

RESEARCH: Whether conducting basic research in the lab or clinical research in the hospital, Memorial Hermann and UTHealth Medical School are focused on studying diseases at the genetic, cellular and molecular levels to prevent and reverse the effects of neurological injuries and conditions.

News of Note

PEOPLE

Mischer Neuroscience Institute and UTHealth Medical School Welcome New Recruits

Eight physicians have joined the staff of the Mischer Neuroscience Institute (MNI) at Memorial Hermann and The University of Texas Health Science Center at Houston (UTHealth) Medical School.

ROBERT KNOWLTON, M.D.
Associate Professor, Department of Neurology
Director, Epilepsy Research
UTHealth Medical School

Renowned epileptologist Robert Knowlton, M.D., comes to MNI from the University of Alabama at Birmingham (UAB) Epilepsy Center, where he was acting director of the UAB division of Epilepsy, the MEG Laboratory and the Seizure Monitoring Unit. Dr. Knowlton will serve as clinical director of Magnetoencephalography (MEG) Services at Memorial Hermann-Texas Medical Center and director of epilepsy research at the UTHealth Medical School. With the addition of a second Magnes 3600 WH Magnetoencephalography Brain Imaging System to MNI's full suite of diagnostic tools, he will support the growth in the Institute's epilepsy program.

Dr. Knowlton received his medical degree at Louisiana State University School of Medicine in New Orleans, followed by a neurology residency at the University of California, Los Angeles School of Medicine and a fellowship in epilepsy and clinical neurophysiology at the University of California, San Francisco School of Medicine. His research focuses on neuroimaging and clinical decision-making in the surgical treatment of seizure disorders and brain tumors. He has served as principal investigator of studies funded by the National Institutes of Health and other granting organizations, and is a section ad hoc reviewer and member of the Epilepsy Common Data Elements Working Group at NIH. A member of the editorial board of *Journal Watch Neurology*, he is an ad hoc reviewer for the *Annals of Neurology, Brain, Human Brain Mapping, Epilepsia, Neurology, Neuroreport, Neuro Image, Journal of Neuroimaging, Journal of Clinical Neurophysiology* and *Stroke*. A frequent invited lecturer and the recipient of numerous awards and honors, Dr. Knowlton is certified by the National Board of Psychiatry and Neurology, Adult Neurology; the American Board of Clinical Neurophysiology; and the American Society of Neuroimaging (MRI/CT certification).

MARK DANNENBAUM, M.D.
Assistant Professor, Vivian L. Smith Department of Neurosurgery
UTHealth Medical School

A vital addition to MNI's neurosurgery team, endovascular neurosurgeon Mark Dannenbaum, M.D., will serve as an assistant professor of neurosurgery at the UTHealth Medical School. After receiving his medical degree at UTHealth Medical School, he completed a residency in neurosurgery at Baylor College of Medicine, followed by a fellowship in vascular neurosurgery at Harvard Medical School/Brigham and Women's Hospital and a subsequent fellowship in interventional neuroradiology at Emory University School of Medicine, where he also served as an attending physician at the Emory Clinic and clinical instructor in neurosurgery at Emory University School of Medicine.

Dr. Dannenbaum has won numerous awards and honors, including election into Phi Beta Kappa and Alpha Omega Alpha. He has coauthored research focusing on cerebrovascular surgery and neurointerventional techniques. He is a member of the Congress of Neurological Surgeons, American Association of Neurological Surgeons and the Texas Medical Association.

OLEG CHERNYSHEV, M.D., PH.D.
Director, TIRR Memorial Hermann Sleep Medicine Center
Assistant Professor, Department of Neurology
UTHealth Medical School

Oleg Chernyshev, M.D., Ph.D., a diplomate of the American Board of Psychiatry and Neurology, has joined the medical staff at TIRR Memorial Hermann from Louisiana State University Health Sciences Center in Shreveport, where he was an attending physician. He is medical director of the TIRR Memorial Hermann Sleep Medicine Center.

After earning his medical degree at Sechenov Moscow Medical Academy in Moscow, Russia, Dr. Chernyshev completed a combined clinical neurology residency and doctorate at the same institution, where he focused on cerebral mechanisms of migraine pathogenesis. During his residency and doctoral program, he completed a clinical and research fellowship at the Houston Headache Clinic, followed by a neurosonology fellowship at the Mischer Neuroscience Institute's Stroke Center. He is certified in neurosonology by the American Society of Neuroimaging.

Following an internship in internal medicine at Atlantic City Regional Medical Center in New Jersey, he completed a neurology residency and a vascular neurology fellowship at the UTHealth Medical School, and a sleep medicine fellowship at Louisiana State University Health Sciences Center.

Dr. Chernyshev was awarded the American Sleep Foundation/American Academy of Sleep Medicine's 2010 Physician Scientist Training Award in the Best Science category. He has received other research awards, including the Louisiana State University

Health Sciences Center/Institute for Cardiovascular Disease and Imaging Intramural Research Support Award and the Russian Presidential Grant.

He is a member of the American Academy of Sleep Medicine, American Academy of Neurology, American Stroke Association, American Headache Society, International Headache Society and World Stroke Organization. He is an author and coauthor of research published in numerous medical journals, including *Neurology, Stroke, Headache, Cerebrovascular Diseases* and others.

KIWON LEE, M.D.
Co-Director, Neurotrauma Intensive Care Unit
Mermorial Hermann-TMC
Associate Professor, Departments of Neurology and Neurosurgery
Vice Chair, Clinical Services, Department of Neurology, UTHealth Medical School

Neurointensivist Kiwon Lee, M.D., is an experienced critical care specialist with expertise in neurology and a strong interest in driving quality initiatives. At MNI, he will serve as co-director of the Neurotrauma Intensive Care Unit; he is an associate professor of neurology and neurosurgery and vice chair for clinical services in the department of Neurology at the UTHealth Medical School.

Prior to joining MNI, Dr. Lee was an assistant professor of neurology and neurological surgery at Columbia University College of Physicians and Surgeons, and a faculty neurointensivist in the Critical Care Division of the Neurological Institute of New York, New York-Presbyterian Hospital and Columbia Presbyterian Medical Center. A graduate of Columbia University, Dr. Lee completed his residency and chief residency in neurology at the State University of New York at Stony Brook and a subspecialty fellowship in neurological and neurosurgical critical care at Harvard Medical School. In addition to Columbia University, he has held staff appointments at Harvard Medical School and the Jefferson Medical College at Thomas Jefferson University in Philadelphia, where he was director of the Neuro-Intensive Care Unit and program director of the neurocritical care fellowship.

Triple boarded in neurology, neurocritical care and stroke/vascular neurology, Dr. Lee is a diplomate of the American Board of Psychiatry and Neurology and the United Council for Neurologic Subspecialties. He is an honorary fellow of the American Heart Association, the American Stroke Council, the American College of Physicians and the American College of Critical Care Medicine. He holds memberships in numerous professional and scientific societies and has made invited presentations and keynote addresses nationally and internationally. Dr. Lee has organized and directed an international multidisciplinary critical care conference combining neurology, neurological surgery, and critical care medicine, and he has given numerous core curriculum lectures at medical schools and trained multiple generations of residents and fellows in neurology and neurosurgery. The coauthor of more than 100 peer-reviewed journal abstracts, original articles and textbook chapters, Dr. Lee serves as a peer reviewer for *Cerebrovascular Disease, Neurocritical Care, Neurology, Journal of Intensive Care Medicine, Hospital Practice* and *Critical Care Yearbook*. Dr. Lee is the author and editor-in-chief of a formal textbook in neurological and neurosurgical critical care, *The NeuroICU Book*.

ALEX CHOI, M.D.
Assistant Professor, Departments of Neurology and Neurosurgery
UTHealth Medical School

H. Alex Choi, M.D., further expands the MNI team of neuro-trauma critical care specialists and will serve as an assistant professor of neurology and neurosurgery at the UTHealth Medical School. He received his medical degree at Columbia University College of Physicians and Surgeons and was chief resident in neurology and, later, a clinical fellow at Columbia University Medical Center – The Neurologic Institute of New York Division of Neuro-Critical Care.

A member of the Neurocritical Care Society and the American Academy of Neurology, Dr. Choi has received grant support from the National Institutes of Health, including an NIH Neuroepidemiology Training Grant. He has coauthored three book chapters and research published in peer-reviewed journals, including *Archives of Neurology, Stroke, Neurocritical Care, Neurologist* and *Archives of General Psychology*, among others. He has been co-investigator of various clinical research projects and sponsored trials related to neurocritical care medicine.

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

David Sandberg, M.D., F.A.C.S., F.A.A.P., joins the MNI team as director of pediatric neurosurgery. Dr. Sandberg comes 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. At the UTHealth Medical School, he holds joint appointments as an associate professor in the departments of Neurosurgery and Pediatric Surgery. 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.

Dr. Sandberg is a fellow of the American College of Surgeons and the American Academy of Pediatrics, and a member of the American Society for Pediatric Neurosurgery. He is a diplomate of the American Board of

Neurological Surgery and the American Board of Pediatric Neurological Surgery. He received his undergraduate degree from Harvard University, his medical degree from the Johns Hopkins University School of Medicine and completed neurosurgery residency training at Weill Medical College of Cornell University/New York Presbyterian Hospital. Dr. Sandberg was awarded the Resident Traveling Fellowship in Pediatric Neurosurgery by the American Association of Neurological Surgeons and the Congress of Neurological Surgeons, and he completed his fellowship at the Hospital for Sick Children in Toronto. After residency, he completed fellowship training in pediatric neurosurgery at the Children's Hospital Los Angeles, which is affiliated with the Keck School of Medicine of the University of Southern California.

Dr. Sandberg's major research interests focus on novel means of delivering therapeutic agents into the brain for the treatment of childhood brain tumors. He has developed translational research models in animals and is currently initiating a Phase I clinical trial based on these research efforts. He has been principal investigator of studies funded by the Woman's Cancer Association of the University of Miami, Miami Children's Hospital Foundation and the Emily Dorfman Foundation, and has served on medical missions to Guatemala, Honduras, Peru, Uganda and Haiti. He is a member of the board of directors of the Foundation for International Education in Neurological Surgery.

Dr. Sandberg is editor of the *ISPN Guide to Pediatric Neurosurgery, Tumor Section*, and is an ad hoc reviewer for a number of neurosurgery and neuroscience journals. He has co-authored textbook chapters and numerous manuscripts in peer-reviewed journals including *Neurosurgery, Journal of Neurosurgery: Pediatrics, Journal of Neuro-Oncology, Journal of Child Neurology* and *Pediatric Neurosurgery*.

JOHN LINCOLN, M.D., PH.D.
Assistant Professor, Department of Neurology
UTHealth Medical School

John Lincoln, M.D., Ph.D., joins the Mischer Neuroscience Institute team from University Hospital and the Multiple Sclerosis Center at the University of Medicine and Dentistry of New Jersey in Newark, where he served as an attending neurologist and clinical neurologist, respectively. A diplomate of the American Board of Psychiatry and Neurology, Dr. Lincoln's clinical and research interests focus on various immune-mediated neurological disorders, including multiple sclerosis (MS). He is currently involved in imaging research to further understand the pathological processes and identify markers of neurodegeneration in MS.

At MNI, he will incorporate cutting-edge imaging techniques in the evaluation and treatment of patients with MS.

After earning his doctorate in immunology at Texas Tech University in Lubbock, he received his medical degree at the Texas Tech University Health Sciences Center. He completed his residency in neurology at the UTHealth Medical School where he was chief resident, followed by a fellowship in neuroimmunology at the University of Medicine and Dentistry of New Jersey.

An assistant professor in the department of Neurology at UTHealth Medical School, Dr. Lincoln has given numerous abstract and invited presentations on multiple sclerosis. He is a coauthor of a chapter in the textbook *AIDS, Drugs of Abuse, and the Neuroimmune Axis*, and has coauthored articles that have appeared in numerous peer-reviewed publications, including the *Journal of Neurology, Neurosurgery and Psychiatry; Journal of the Neurological Sciences; Neurology; American Journal of Respiratory Cell and Molecular Biology*; and *Cellular Immunology*.

THY P. NGUYEN, M.D.
Assistant Professor, Department of Neurology
Co-Director, Electromyography Laboratory
UTHealth Medical School

After receiving her medical degree at Baylor College of Medicine in Houston, Thy P. Nguyen, M.D., completed a residency in neurology at the same institution, where she was chief neurology resident and the winner of 2009 and 2010 Resident Teaching Awards. She completed a clinical neurophysiology fellowship at the UTHealth Medical School, followed by further training in neuromuscular medicine at Johns Hopkins Hospital, with a special focus in electromyography and single-fiber EMG.

An assistant professor in the department of Neurology, Dr. Nguyen's clinical and research interests include electromyography and neuromuscular medicine. At Memorial Hermann-TMC and UTHealth Medical School, she is co-director of the Electromyography Laboratory and the Clinical Neurophysiology Fellowship Program, and will see patients for electromyography studies and neuromuscular medicine.

Dr. Nguyen is a member of the American Academy of Neurology, the American Academy of Neurology and Electrodiagnostic Medicine, the Texas Neurological Society and the Houston Neurological Society.

Sean Savitz, M.D., Named Stroke Program Director

SEAN SAVITZ, M.D.
Professor, Department of Neurology
Director, Stroke Program
Director, Vascular Neurology Fellowship
UTHealth Medical School

Sean Savitz, M.D., has been named director of the Stroke Program at the Mischer Neuroscience Institute (MNI) at Memorial Hermann. He has been co-director of the Vascular Neurology Program, director of translational stroke

research and director of the Vascular Neurology (Stroke) Fellowship Program at The University of Texas Health Science Center at Houston (UTHealth) Medical School since 2007.

"Sean will bring great new ideas and leadership to the program, while at the same time continuing its tradition of excellent clinical research and education," says James Grotta, M.D., co-director of MNI, professor and head of the department of Neurology at the UTHealth Medical School and founder of the Stroke Program. "Under Sean's direction, the Vascular Neurology Fellowship Program has doubled in size and productivity. At the same time, he has developed and funded the world's leading translational research program in stem cell therapy for stroke."

Dr. Savitz graduated from Harvard University and received his medical degree from the Albert Einstein College of Medicine. He completed his residency and fellowship in the Harvard Medical School Neurology Program at Beth Israel Deaconess Medical Center and Children's Hospital in Boston.

MNI Adds a Transitional Care Coordinator to Help Personalize the Patient Experience

Kim Vu, L.M.S.W., has joined the Mischer Neuroscience Institute team in the newly created position of transitional care coordinator. In her new role, she will work with MNI's multidisciplinary team to develop educational tools and programs to help patients transition through the continuum of care, and follow up with them to ensure that their needs are being met post discharge. She will also coordinate and facilitate patient support groups.

"The transitional care coordinator is a relatively new concept," says Vu, who has a master's in social work with a concentration in healthcare from the University of Houston. "Our goal is to ensure that patients and their families have very personal attention when they arrive at MNI and a good understanding of what to expect of their experience here. Many of our discharged patients go to another level of care, so we also want to make sure that they understand their options for post-acute care early on during their stay. It's all about providing education to our patients and their families and keeping them informed."

Transitional Care Coordinator Kim Vu, L.M.S.W., facilitates MNI's Stroke Support Group.

In Memoriam: Frank Yatsu, M.D.

Frank Yatsu, M.D., professor emeritus of neurology, died March 9, 2012. He was 79.

Dr. Yatsu joined The University of Texas Health Science Center at Houston (UTHealth) Medical School in 1982 as the second chair of the department of Neurology and was celebrated at a retirement ceremony on January 14, 2011.

A native of Los Angeles, Dr. Yatsu moved with his family to Cleveland, Ohio, in the mid-1940s. As a Boy Scout in Cleveland, he received a full scholarship to Phillips Academy in Andover, Massachusetts. At Andover, he quickly became popular with his gregarious sense of humor and wit, and was referred to as the "walking dictionary." He went on to receive his baccalaureate from Brown University on a full four-year wrestling scholarship, and completed medical school at Case Western Reserve University. He completed an internal medicine residency at University Hospital in Cleveland and a neurochemistry fellowship at Albert Einstein College of Medicine in New York.

From 1965 to 1967, Dr. Yatsu served as a lieutenant commander at the U. S. Naval Academy in Great Lakes, Illinois, and later went to work for the department of Neurology at the University of California Medical Center, where he became the vice chair of the department and chief of neurology at San Francisco General Hospital. From 1969 to 1974, Dr. Yatsu was appointed a trustee of Brown University, the first Asian American in the history of the university to receive the honor. He was named chair of neurology at the University of Oregon Health Sciences Center in Portland in 1975, a position he maintained until moving to Houston in 1982.

After stepping down as chair of the department of Neurology 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 World Stroke Organization and the World Health Organization.

Dr. Yatsu is widely recognized as one of the pioneers of the modern era of cerebrovascular disease. He was the principal investigator of one of the first National Institutes of Health-funded Stroke Centers at Oregon Health and Science University. He was one of the few neurologists studying the molecular basis of lipid metabolism underlying cerebrovascular atherosclerosis, research that continues to this day. He was the leading investigator of some of the first clinical trials of acute stroke therapy and was one of the founding editors of the most highly regarded textbook in stroke, *Stroke: Pathophysiology, Diagnosis and Management*, now in its fifth edition. He was widely recognized as an outstanding teacher.

The annual Yatsu Day Symposium, sponsored by the Mischer Neuroscience Institute and the UTHealth Medical School each fall, was established in his honor. The day-long CME conference, which focuses on current issues in stroke management, will be continued in his memory.

Frank Yatsu, M.D., former professor emeritus of neurology, is pictured here with his wife Michiko Yatsu.

CLINICAL OUTREACH

Improving Online Access for Patients and Physicians

More than a year has passed since leadership at Memorial Hermann-Texas Medical Center made the decision to create a distinct domain and new design for the Mischer Neuroscience Institute (MNI) website. Since then, they've tracked a dramatic increase in visits to the site.

"Dr. Kim's overall goal was to give MNI a greater presence on the Internet and make the website more useful to consumers and referring physicians," says Will Radcliffe, Web producer for Memorial Hermann-Texas Medical Center. "Early on, we made the decision to make the process of contacting us online very easy. We're mindful of the fact that medical information and healthcare itself can be hard to access, and that our environment can be intimidating to consumers." Neurosurgeon Dong Kim, M.D., is director of MNI and professor and chair of the Vivian L. Smith Department of Neurosurgery at The University of Texas Health Science Center at Houston (UTHealth) Medical School.

To break down barriers between MNI and consumers, the Web design team added two portals that provide immediate access. "Get a second opinion" and "Contact us" are quick links in the upper right-hand side of the site's first page. Consumers who enter their names, phone numbers, email addresses and a brief description of their condition get a quick response. A new "Refer a patient" link provides physicians with fields to enter their names, phone numbers, email addresses, and the name of a preferred MNI-affiliated physician.

"We hoped that making contact information easily accessible would help bridge the gap between visitors to our site and the Institute," Radcliffe says. "Since adding those three access portals, we've seen our volume of inquiries go through the roof."

To ensure transparency of healthcare information, "Quality and Outcome Measures" appears as a heading on page one of the site, which also includes extensive, easy-to-understand information about a range of neurological conditions, from stroke and epilepsy to multiple sclerosis and brain tumors, as well as the treatments and technologies available at the Institute.

Memorial Hermann search engine optimization (SEO) specialist Kelly McCormick works with Radcliffe to ensure that website content is accessible to Web search engines. "The design team created a very comprehensive and authoritative website," McCormick says. "MNI's capabilities speak for themselves. My job is to make sure that the Institute is in the conversations. We find it very easy to guide consumers to the website because MNI is recognized as a neuroscience authority locally and nationally."

Physicians and patients have access to hour-long webinars on a variety of topics, educating them on conditions and the treatments that are available.

Any media coverage MNI gets also helps drive consumers to the site. For instance, a nationally televised ABC *World News* segment on trigeminal neuralgia featuring

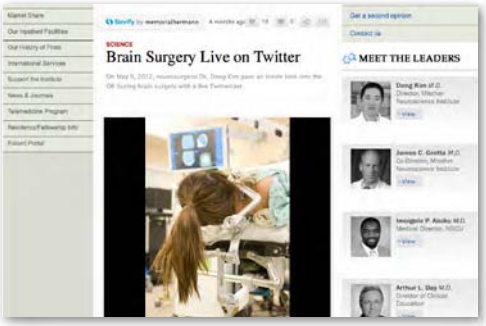
Patients can now use an online portal for easy access to information, which bridges the gap between healthcare consumers and MNI physicians.

Dr. Kim led to an increase in traffic and prompted a Facebook campaign targeting people who mention the disorder in their profiles. Dr. Kim's trigeminal neuralgia webinar is also available on YouTube and, at the time of publication, had been viewed 5,100 times, in addition to 7,600 views on the MNI website.

Radcliffe says the best measure of MNI's success on the Web is the continued increase in visits to the site. "We're showing record numbers every month, which means we're helping more patients and families gain access to the high-quality care available at the Mischer Neuroscience Institute."

An Inside Look at Brain Surgery Through a Live Twittercast

Seeking to educate the public about brain tumors and brain surgery, Dong Kim, M.D, recently performed a brain tumor resection on a 21-year-old woman during a live Twittercast from Memorial Hermann-Texas Medical Center. The social media event marked the third in a series of live online events presented by Memorial Hermann to provide healthcare consumers and medical professionals with an opportunity to participate and learn about the most innovative surgical procedures available. It featured a rapid play-by-play of video, pictures and tweets, including a live video feed from a microscope that provided the surgeon's view as Dr. Kim and his team removed a cavernous angioma from the right side of the young woman's brain.



Social media offers an opportunity to engage large numbers of people in a powerful way.

"Social media offers a unique opportunity to reach large numbers of people and engage them in a powerful way," says Dr. Kim, who is director of the Mischer Neuroscience Institute, chief of neurosurgery at Memorial Hermann-Texas Medical Center and professor and chair of the Vivian L. Smith Department of Neurosurgery at The University of Texas Health Science Center at Houston (UTHealth) Medical School. "Our goal in performing this surgery live via Twitter was to take the general public into the OR to see what happens during a brain surgery. Some of our viewers may have a loved one who is considering a similar procedure. We're hoping they can glean some information from the Twittercast that will help them make a decision about whether surgery is the right choice for them."

"SOCIAL MEDIA OFFERS A UNIQUE OPPORTUNITY TO REACH LARGE NUMBERS OF PEOPLE AND ENGAGE THEM IN A POWERFUL WAY."

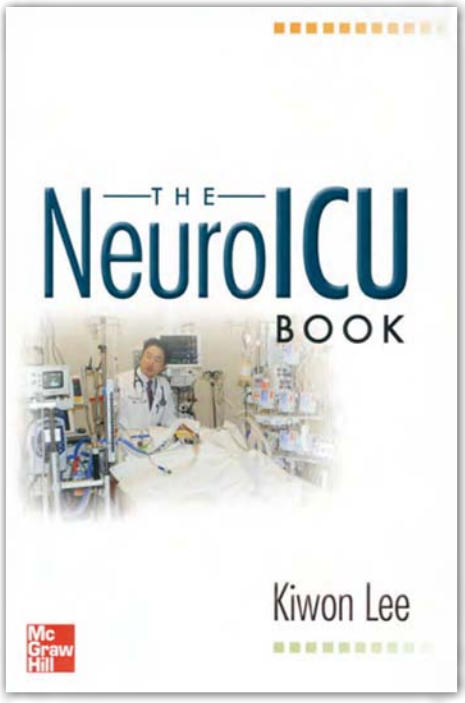
Each year, approximately 190,000 people in the United States are diagnosed with brain tumors. While relatively rare, both malignant and benign brain tumors can be life threatening for people of all ages. For many patients, surgical removal, or resection, of the tumor is the first choice for treatment. Dr. Kim performs more than 400 surgical procedures a year for brain tumors, cerebral aneurysms, trigeminal neuralgia and Chiari malformations.

For this surgery, Dr. Kim and his surgical team used neuronavigation, a set of computer-assisted technologies, to identify the entry point and the precise location of the tumor in the patient's brain. A portion of the skull was removed in a craniotomy, and a microscope was used to locate and excise the tumor. Following removal of the tumor, the team replaced the skull bone and completed the surgery.

Neurosurgeon Scott Shepard, M.D., who is affiliated with MNI and is an assistant professor of neurosurgery at the UTHealth Medical School, was onsite with the Twittercast production team to respond to questions and comments in real time during the event.

The Twitter event, which was watched live by 237,000 viewers globally, is archived at www.mhmni.com/brain-tumor-surgery-twittercast.

A New Textbook by Kiwon Lee, M.D., Presents Current Perspectives in Neurocritical Care



Neurointensivist Kiwon Lee, M.D., an experienced critical care specialist with a strong interest in driving quality initiatives, has written the first practical, protocol-based guide to the emerging field of neurocritical care. Published by McGraw Hill Medical, *The NeuroICU Book* combines the latest evidence-based clinical perspectives in critical care medicine, neurology and neurosurgery.

Using detailed case studies and a question-and-answer format, the book helps build competency in recognizing acute changes in neurologic function and addresses organ insufficiencies and failures, exposing readers to the real-life challenges of the modern neuroscience ICU. In addition to providing an indispensible primer for daily clinical work, the book's balanced coverage of neurological and critical care provides outstanding preparation for the neurocritical care board certification exam.

In his foreword, George C. Newman, M.D., Ph.D., chair of the department of Neurosensory Sciences at Albert Einstein Medical Center in Philadelphia, writes, "This work is a dialogue. It could be between two colleagues from different disciplines, between a resident or fellow with a mentor, or between two neurointensivists trying to work through a challenging patient care dilemma. Each chapter considers a case vignette or a small number of vignettes. The patients presented illustrate the typical, common problems encountered in a Neuro ICU. This book is sure to be a favorite for many years to come. It is not a volume that will sit on an office shelf; it will live out in the ICU or the ED. One can only hope that the binding and pages are sturdy enough to handle the usage."

Dr. Lee joined the staff of the Mischer Neuroscience Institute in 2012.

EVENTS

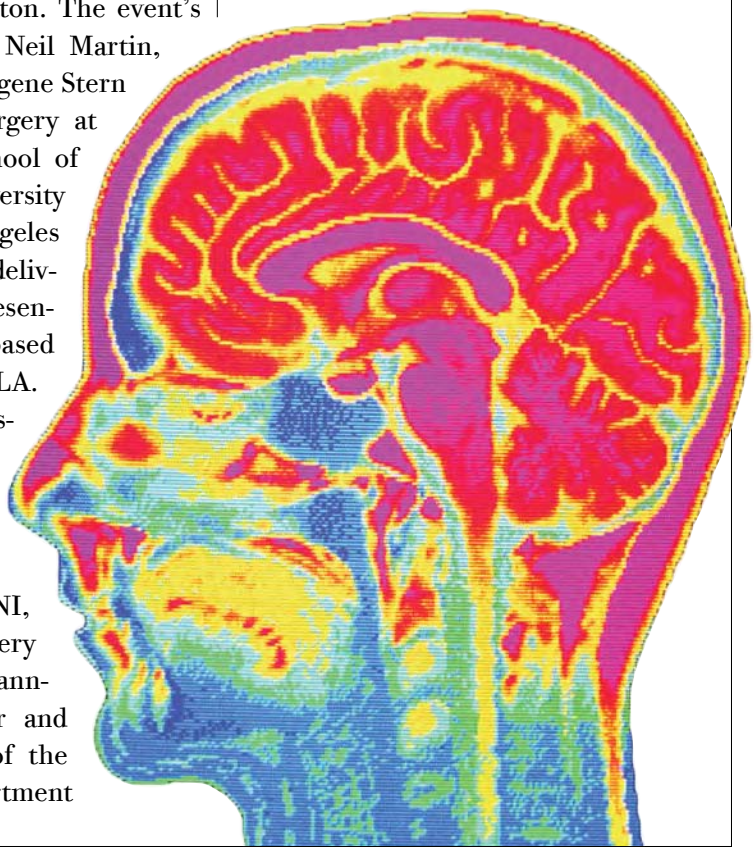
MNI Sponsors Quality Initiatives in Neuroscience Symposium

About 120 physicians and other healthcare professionals attended the Mischer Neuroscience Institute's Symposium on Quality Initiatives in Neuroscience, held last February in Houston. The event's featured speaker was Neil Martin, M.D., chair and W. Eugene Stern Professor in Neurosurgery at the David Geffen School of Medicine at the University of California, Los Angeles (UCLA). Dr. Martin delivered the keynote presentation on incentive-based quality initiatives at UCLA.

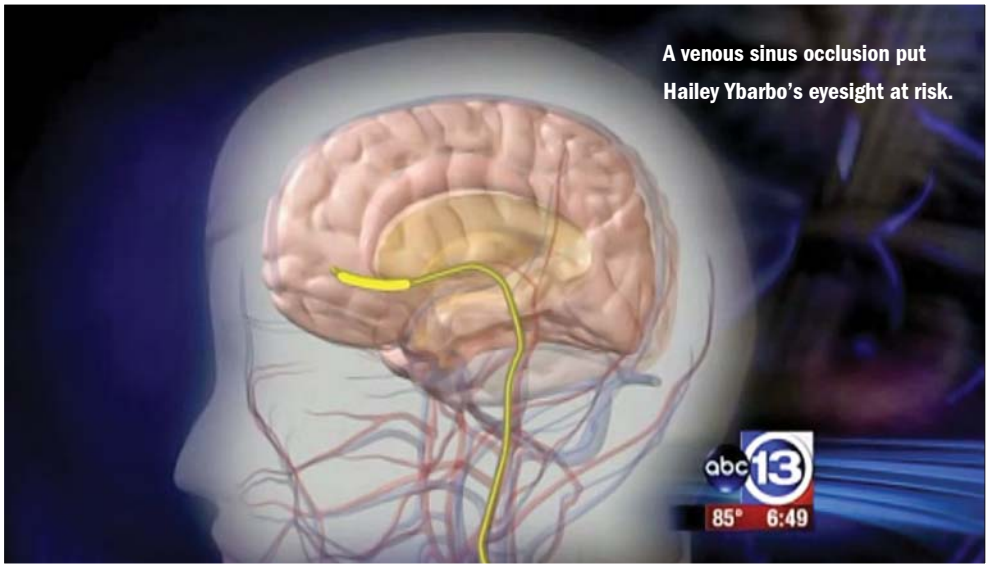
"It was a very successful CME course that drew national and international attendees," says Dong Kim, M.D., director of MNI, chief of neurosurgery at Memorial Hermann-Texas Medical Center and professor and chair of the Vivian L. Smith Department of Neurosurgery at The University of Texas Health Science Center at Houston (UTHealth) Medical School. "We were pleased to have Dr. Martin as our guest of honor."

Other topics discussed at the symposium were quality initiatives at the Vivian L. Smith Department of Neurosurgery by Dong Kim, M.D.; stroke team quality improvement efforts by James C. Grotta, M.D., co-director of MNI, chief of neurology and director of the Stroke Center at Memorial Hermann-TMC, and professor, chair and Roy M. and Phyllis Gough Huffington Distinguished Chair in Neurology at the UTHealth Medical School; and reduction in complications through the use of protocols by Arthur L. Day, M.D., director of clinical education at MNI and professor and vice chair of the Vivian L. Smith Department of Neurosurgery.

The CME event, which is held annually, focuses on topics of current interest in neurology and neurosurgery.



MNI In The News



Recurring Ear Infections Can Have Deadly Consequences

Four-year-old girl Hailey Ybarbo and her family experienced a worst-case scenario when a recurrent ear infection spread to the bone behind her ear, causing a venous sinus occlusion that put her eyesight at risk. Neurointerventional radiologist and cerebrovascular neurosurgeon P. Roc Chen, M.D., used an innovative technique to treat his patient. Instead of the standard-of-care shunt placement in the brain, Dr. Chen cleared the blockage by threading a balloon catheter into the occluded blood vessel in the brain and inflating it, which restored blood flow. Minutes after the surgery, Hailey was comfortable and playful, and her vision began to return. The story appeared on Houston's ABC affiliate KTRK, Channel 13, in April 2012.

Alzheimer's Test Moves Detection a Big Step Forward

As a neurologist specializing in the treatment of dementia, Paul Schulz, M.D., became the first in Houston to administer a test recently approved by the Food and Drug Administration to detect the presence of proteins in the brain linked to Alzheimer's disease. The test uses a radioactive agent to tag amyloid proteins, a hallmark of Alzheimer's, during a brain imaging scan. Prior to approval of the test, physicians had to rely on cognitive testing and other techniques to diagnose the disorder.

Dr. Schulz expects the test to be covered by Medicare and other insurance providers in the future. In an article that appeared in the *Houston Chronicle* in June 2012, he suggested that one of the most powerful uses for the technology may lie in its ability to speed research, both to determine who is at risk for Alzheimer's and to find new treatments.

Telemedicine Provides High-Tech Care

Neurologist Teddy Wu, M.D., director of the Telemedicine Program at the Mischer Neuroscience Institute, was interviewed about a relatively new program that gives patients in outlying Southeast Texas hospitals immediate access to a stroke specialist.

"Neurologists are few and far between in small communities," Dr. Wu said. "It's hard for community hospitals to provide 24/7 neurology coverage. Our telemedicine program helps fill the gap." A project of Memorial Hermann-Texas Medical Center, the MNI Telemedicine Program provides 24/7 neurological consultations to network hospitals through the use of telemedicine technologies such as digital imaging and real-time video conferencing. MNI collaborates with participating community hospitals to deliver the highest quality acute neurological care, to collaborate on treatment protocols and plans, and to provide continuing education for emergency physicians and nurses to ensure that patients have access to best-practice stroke treatment. The segment aired on NBC's Houston affiliate KPRC, Channel 2 in April 2012.

Eliminating Pain: How a Piece of Felt Did What Painkillers Could Not

Dr. Kim uses a tiny piece of felt to cushion a trigeminal nerve compressed by two blood vessels, relieving the pain of trigeminal neuralgia.

Linda Brown was taking more than 20 pills a day to combat the debilitating face pain that she says felt like "a bad electric shock." Diagnosed with trigeminal neuralgia, she saw several physicians before being referred to Dong Kim, M.D., director of the Mischer Neuroscience Institute and professor and chair of the Vivian L. Smith Department of Neurosurgery at The University of Texas Health Science Center at Houston (UTHealth) Medical School. In a two-hour surgery, Dr. Kim used a tiny piece of felt to cushion the trigeminal nerve, which was compressed by two blood vessels. He was interviewed about the surgery on ABC *World News* in October 2011.

Inducing Hypothermia During Medical Emergencies Gains Ground

Recent research shows that therapeutic cooling of patients suffering from oxygen loss, stroke or spinal cord and traumatic brain injury can mitigate the damaging effects. James C. Grotta, M.D., co-director of MNI and professor and chair of the department of Neurology at The University of Texas Health Science Center at Houston (UTHealth) Medical School, discussed therapeutic hypothermia treatment for stroke patients in an article that appeared in the *Los Angeles Times* in August 2011. Dr. Grotta reported that cooling stroke patients is challenging because they are usually conscious, making hypothermia an excruciating experience. The inevitable shivers can counter the beneficial effects of cooling. To improve outcomes, Dr. Grotta and his team use sedation and a treatment that delivers cold fluids to a vein through a catheter to chill the blood, while warm air is blown over the patient's skin to ease discomfort during the procedure.

Houston Neurosurgeon Talks About Breaking into a Mostly Male Specialty

As one of only 200 female neurosurgeons in the nation, Michele Johnson, M.D., is a frequent invited speaker.

One of only 200 female neurosurgeons in the nation, spine surgeon Michele Johnson, M.D., was interviewed for a *Houston Chronicle* article that appeared in September 2011. According to the group Women in Neurosurgery, the number of female neurosurgeons has grown from two in the 1960s to 219 in July 2011. Still, only about 7 percent of the nation's 3,300 board-certified neurosurgeons are women, according to the American Association of Neurological Surgeons.

In the interview, Dr. Johnson, who is director of The University of Texas Health Science Center at Houston (UTHealth) Medical School's Spine Program, discussed her career goals. "Right now, my biggest interests are spinal trauma, spinal cord injuries and degenerative spine. It would be great if we could come up with some kind of treatment so that when a patient has a spinal cord injury, we could lessen the injury and decrease the loss of motor function. My own realistic career goals are to do a good job, take care of patients and teach residents how to go out and do those kinds of things. If I can get more women involved, that's what I want to do. I was very lucky. I had supportive parents, and I had very good mentors who led me to where I am."

ABC Medical Moments Features MNI's Stroke Program

In a segment of ABC's *Medical Moments* featured on abcnews.com in September 2011, James C. Grotta, M.D., co-director of MNI and professor and chair of the department of Neurology at The University of Texas Health Science Center at Houston (UTHealth) Medical School, stressed the importance of seeking care immediately following a stroke. Also featured was former patient Craig Nelson, who was treated with tPA after presenting at the Memorial Hermann-TMC Emergency Center. In addition to the standard-of-care treatment, Nelson was enrolled in a clinical trial studying the use of ultrasound.

"We carried out a study several years ago that showed if you hold an ultrasound probe against the skull and beam it at the clot for two hours during tPA infusion and immediately afterwards, you can almost triple the rate at which the artery opens up," Dr. Grotta said. He and his research team are now testing a hands-free helmet device to deliver the ultrasound treatment.

Accolades

UTHealth Medical School Fellow Honored with New Investigator Award

Amrou Sarraj, M.D., (left) receives the Mordecai Y. T. Globus New Investigator Award at the 2012 International Stroke Conference.

Amrou Sarraj, M.D., a vascular neurology fellow at The University of Texas Health Science Center at Houston (UTHealth) Medical School, received the Mordecai Y. T. Globus New Investigator Award presented by the American Stroke Association at the International Stroke Conference 2012.

Dr. Sarraj's work "Optimizing Prediction Scores for Poor Outcome After Intra-arterial Therapy for Anterior Circulation Acute Ischemic Stroke" was presented on February 2 in New Orleans. The study suggests that combining critical and radiographic variables can better predict poor outcome after patients undergo intra-arterial thrombolysis.

The Globus Award is named for the late renowned cerebrovascular researcher Mordecai Y. T. Globus, M.D., and is given to a researcher who is still in training. "It's a great honor for me and a significant achievement for Mischer Neuroscience Institute's Stroke Center and the UTHealth Medical School," Dr. Sarraj says.

Research

Prospective Case-Control Study of Chronic Cerebrospinal Venous Insufficiency: Neurosonography Results

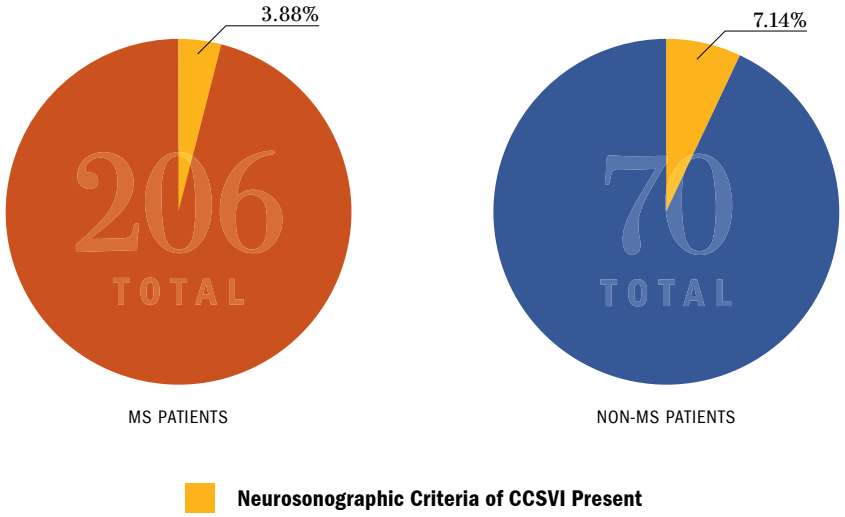
PRINCIPAL INVESTIGATOR: JERRY WOLINSKY, M.D.

The idea that chronic cerebrospinal venous insufficiency (CCSVI) may have a unique role in multiple sclerosis (MS) sparked a firestorm of interest and the embrace of venoplasty as a potential therapy. But until recently, no randomized, controlled clinical trials had been conducted to confirm the phenomenon originally described in 2008 by Italian vascular surgeon Paolo Zamboni, M.D., and resolve the questions he and others raised about whether CCSVI exists as a cause of MS or is related to MS in another manner.

Dr. Zamboni and his colleagues based their conclusions on a retrospective analysis of 109 MS subjects, 65 of whom underwent selective venography and venoplasty. His team presented evidence based on transcranial color-coded Doppler and high-resolution echocolor Doppler sonography that suggested an unexpected high incidence of abnormalities in the venous outflow of the central nervous system among patients with all major clinical phenotypes of MS, which was not seen among normal controls or among individuals with a variety of other brain diseases.

A recently completed single-center, prospective case-control study at The University of Texas Health Science Center at Houston (UTHealth) Medical School and the Mischer Neuroscience Institute, which included MS and non-MS patients, provides new information on CCSVI and multiple sclerosis. In the study, a neurosonologist, blind to the subject's diagnosis, used high-resolution B-mode imaging with color and spectral Doppler to investigate extracranial and intracranial venous drainage.

"FINDINGS DESCRIBED AS CCSVI ARE MUCH LESS PREVALENT THAN REPORTED IN DR. ZAMBONI'S RETROSPECTIVE STUDY AND DO NOT DISTINGUISH MS FROM OTHER SUBJECTS."



"We believed that obtaining validation of a reliable diagnostic approach for CCSVI and demonstrating an MS-specific association with the condition was the first logical step toward determining whether we should ever proceed with a definitive, blinded and randomized therapeutic trial of venoplasty as an approach to the treatment of MS," says Jerry Wolinsky, M.D., who is the Bartels Family and Opal C. Rankin Professor of Neurology at the UTHealth Medical School, director of the Multiple Sclerosis Research Group and principal investigator of the study. "In this study, we sought to determine whether neurosonography provides reliable information on cerebral venous outflow patterns." Dr. Wolinsky serves or has served on review and advisory committees of the National Institutes of Health, the National Multiple Sclerosis Society, the Multiple Sclerosis International Federation, the Food and Drug Administration and numerous pharmaceutical houses.

A total of 276 subjects were studied – 206 with MS and 70 without the disorder. Overall, 82 subjects (29.7 percent) fulfilled one of the five criteria for CCSVI: reflux in the internal jugular veins and/or vertebral veins in sitting and supine posture; reflux in the deep cerebral veins; jugular vein stenosis; flow not Doppler detectable; or reverted postural control in the internal jugular veins. However, only 13 (4.7 percent) fulfilled two criteria, the number proposed to qualify as having CCSVI, and none filled more than two criteria. The distribution of subjects with zero, one or two criteria did not differ significantly across all diagnostic groupings, between MS and non-MS subjects or within the MS subgroups. Neurosonographic criteria of CCSVI were present in 7.14 percent of non-MS and 3.88 percent of MS patients. No significant differences emerged between MS and non-MS subjects for extracranial or intracranial venous flow rates.

"Our neurosonographic findings do not support the theory that CCSVI is causally associated with MS," says Andrew Barreto, M.D., head of the Neurosonography Laboratory and a co-investigator on the project. "Findings described as CCSVI are much less prevalent than reported in Dr. Zamboni's retrospective study and do not distinguish MS from other subjects."

On May 10, 2012, the U.S. Food & Drug Administration released a safety communication alerting people with MS to the risk of serious injury and death associated with procedures to treat CCSVI. According to the FDA, "The benefits of these experimental procedures have not been proven, and their promotion as a treatment for MS may lead people with the disease to make treatment decisions without being aware of the serious risks involved."

Study of ALD-401 Derived from Autologous Bone Marrow Delivered via Intracarotid Infusion in Ischemic Stroke Patients

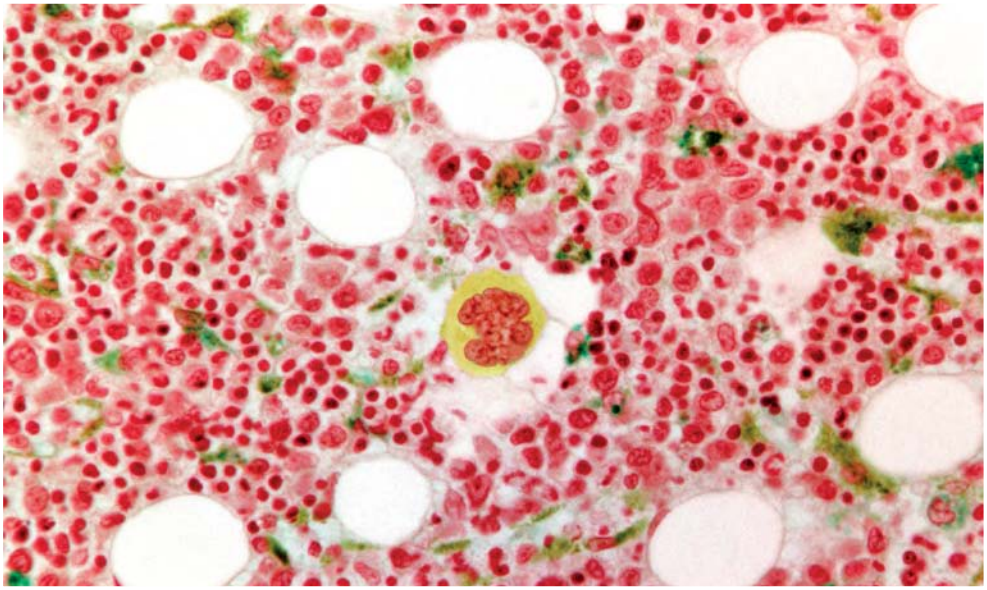
PRINCIPAL INVESTIGATOR: SEAN I. SAVITZ, M.D.

Using a patient's own bone marrow cells to treat acute stroke is feasible and safe, according to the results of a groundbreaking Phase 1 trial at the Mischer Neuroscience Institute (MNI) and The University of Texas Health Science Center at Houston (UTHealth) Medical School.

The trial was the first ever to harvest an acute stroke patient's own stem cells from the iliac crest of the leg, separate them and inject them back into the patient intravenously. The first patient was enrolled in March 2009 at Memorial Hermann-Texas Medical Center, and the study's findings were published in a 2011 issue of the Annals of Neurology.[1]

"To bring stem cells forward as a potential new treatment for stroke patients, we first have to establish safety," says principal investigator Sean I. Savitz, M.D., professor of neurology at the UTHealth Medical School. "We're now conducting an industry-sponsored trial testing ALD-401, which involves administering bone marrow-derived purified stem cells by intra-arterial infusion 13 to 19 days after ischemic stroke." Dr. Savitz is the senior investigator for the study, which is under way at several other institutions.

The clinical trial will enroll 100 participants over a two-year period. A pilot safety cohort phase involving 10 patients has been completed.



Light micrograph showing bone marrow cells.

The trial is unique in two ways: ALD-401 derived from autologous bone marrow is delivered by injection into the carotid artery, and the study includes a sham control arm. Participants at each study site will be randomized in a 3:2 ratio to the treatment or sham control arm. They will undergo either a bone marrow or a sham harvest on days 11 through 17 and be given ALD-401 or a sham procedure 13 to 19 days after the stroke.

Bone marrow cells are processed, sorted and formulated into a 3-milliliter suspension of ALD-401, manufactured by Aldagen. Two days after harvest, participants in the ALD-401 group will have their processed bone marrow cells injected via intracarotid infusion, while control subjects will have a sham infusion.

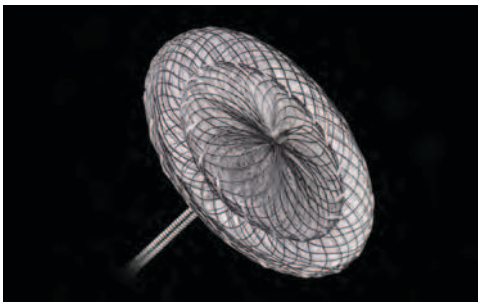
"Most trials conducted using autologous cell therapies are single-arm studies in which each participant is given his or her own cells," Dr. Savitz says. "A two-arm study with a sham is an advancement in terms of trial design and will give us information about potential efficacy of the stem cells."

The estimated study completion date is 2014.

[1] Savitz S, Misra V, Kasam M, Juneja H, Cox Jr. CS, Alderman S, Aisiku I, Kar S, Gee A, Grotta JC. Intravenous autologous bone marrow mononuclear cells for ischemic stroke. *Annals of Neurology*, July 2011. 70(1):59-69.

RESPECT: Randomized Evaluation of Recurrent Stroke Comparing PFO Closure to Established Current Standard-of-Care Treatment

PRINCIPAL INVESTIGATORS: NICOLE R. GONZALES, M.D. AND RICHARD M. SMALLING, M.D., PH.D.



Researchers at MNI are testing the Amplatzer PFO Occluder in patients who have had a cryptogenic stroke due to presumed paradoxical embolism within the previous 270 days.

Is percutaneous patent foramen ovale (PFO) closure using the Amplatzer PFO Occluder superior to the current standard-of-care medical treatment in the prevention of recurrent embolic stroke? Led by co-investigators Nicole R. Gonzales, M.D., who is affiliated with the Mischer Neuroscience Institute, and Richard M. Smalling, M.D., Ph.D., affiliated with the Memorial Hermann Heart & Vascular Institute-Texas Medical Center, researchers are testing the transcatheter

occlusion device in patients who have had a cryptogenic stroke due to presumed paradoxical embolism within the previous 270 days. Dr. Gonzales is an assistant professor of neurology at The University of Texas Health Science Center at Houston (UTHealth) Medical School and Dr. Smalling holds the James D. Woods Distinguished Chair in Cardiovascular Medicine at the UTHealth Medical School and is director of the interventional cardiovascular medicine program at the Heart & Vascular Institute.

"A number of studies have demonstrated a high incidence of PFOs in younger patients with cryptogenic stroke," Dr. Gonzales says. "The PFO is typically sealed in the first year of life, but in some people it remains patent and may represent a potential path for venous thrombus to access the systemic circulation, making PFO a potential risk factor for recurrent stroke, transient ischemic attacks or peripheral embolism."

"A NUMBER OF STUDIES HAVE DEMONSTRATED A HIGH INCIDENCE OF PFOS IN YOUNGER PATIENTS WITH CRYPTOGENIC STROKE."

The risk of recurrence in cryptogenic stroke patients with PFO varies. Two previous studies have produced evidence that demonstrates the risk of recurrence and the role that device closure may play in preventing recurrent strokes.

"The current standard of care is medical treatment with either anticoagulation or antiplatelet agents," Dr. Gonzales says. "In this trial we're considering four medical therapy regimens as standard of care – aspirin alone, Coumadin® alone, clopidogrel alone and aspirin combined with dipyridamole."

Nine hundred study subjects were randomized to receive the Amplatzer PFO Occluder or current standard-of-care medical treatment at 69 institutions across the United States.

The study recently closed to enrollment, and the investigators are finalizing data collection and analyzing results, which they expect to be available in the fall of 2012.

Safety of Pioglitazone for Hematoma Resolution in Intracerebral Hemorrhage (ICH)

PRINCIPAL INVESTIGATOR: NICOLE R. GONZALES, M.D.

The department of Neurology at The University of Texas Health Science Center at Houston (UTHealth) Medical School is part of the National Institutes of Health's Specialized Programs of Translational Research in Acute Stroke (SPOTRIAS) Network. The network, which includes eight stroke research centers across the country, performs early phase clinical projects, shares data and promotes new approaches to therapy for acute stroke. UTHealth Medical School is the only SPOTRIAS center in the southern and southwestern United States.

Among the network projects funded by the National Institute of Neurological Disorders and Stroke (NINDS) under SPOTRIAS is a single-center clinical trial called SHRINC, or "Safety of Pioglitazone for Hematoma Resolution in Intracerebral Hemorrhage (ICH)." The study compares the safety of pioglitazone with standard of care for patients with spontaneous ICH. The hope is that the drug can stimulate the body's own cells to absorb the hematoma faster and as a result, lead to more rapid recovery.

"While data collection remains ongoing, our study is demonstrating the feasibility of obtaining MRI and administering treatment within 24 hours of symptom onset in patients with hypertensive intracerebral hemorrhage," says principal investigator Nicole R. Gonzales, M.D., an assistant professor of neurology at the UTHealth Medical School. "There is currently no approved treatment for ICH, which makes this study particularly exciting. This is also a direct translation from bench to bedside. When we deliver the treatment in the lab in the animal model, we can see that the hematoma disappears faster in the animals receiving treatment."

Dr. Gonzales and her research team are using serial MRI scans to track the recovery and dissolution of the clot. "At the end of the day we'll be able to describe the natural history of clot dissolution, something that has never before been reported," she says.

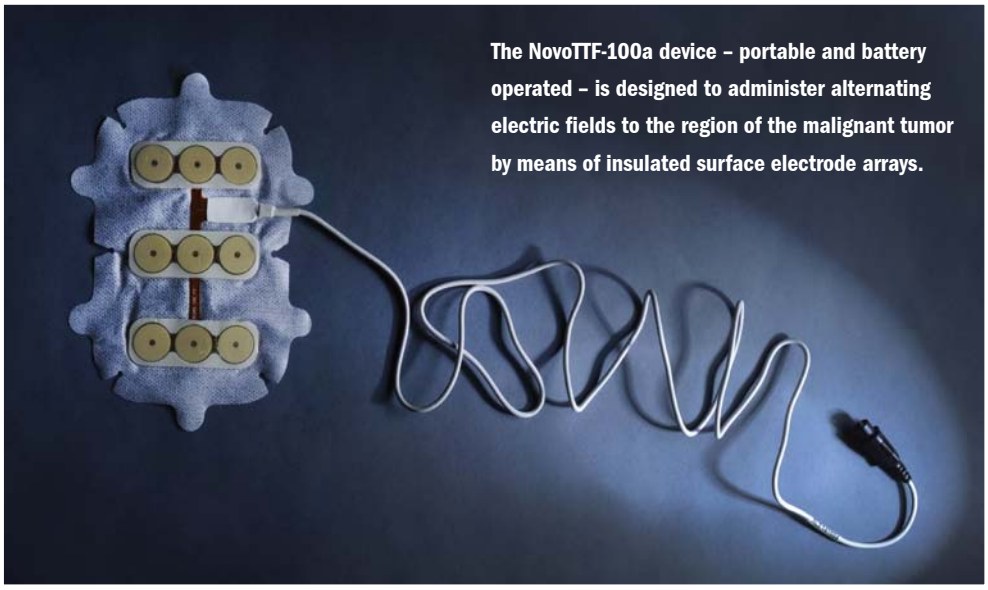
The study, which began in March 2009, has enrolled nearly 70 patients to date out of a total enrollment of 78. The estimated study completion date is September 2012.

The Effect of NovoTTF-100A Together with Temozolomide in Newly Diagnosed Glioblastoma Multiforme

PRINCIPAL INVESTIGATOR: JAY-JIGUANG ZHU, M.D., PH.D.

Of the estimated 19,000 primary brain tumors diagnosed in the United States each year, approximately 60 percent are gliomas, a heterogeneous group of neoplasms that differ in location within the central nervous system, growth potential, invasiveness and response to treatment. With the exception of brainstem gliomas, glioblastoma multiforme (GBM) has the worst statistical prognosis of any central nervous system malignancy – a median survival of 14.6 months. Some 3 to 5 percent of patients survive for more than three years and are classed as long-term survivors.

In a multicenter Phase 3 clinical trial under way at the Mischer Neuroscience Institute (MNI) and open to newly diagnosed glioblastoma patients, researchers hope to improve those odds with an experimental device that generates an electric field to the brain through electrodes applied to the scalp, in combination with the standard-of-care chemotherapy drug temozolomide. Made by NovoCure, the NovoTTF-100A device was tested for safety and efficacy for progressive GBM and found to be safe with minimal side effects. Proven to be as good as the best physician-chosen treatments



The NovoTTF-100a device – portable and battery operated – is designed to administer alternating electric fields to the region of the malignant tumor by means of insulated surface electrode arrays.

for recurrent or progressive GMBs, the device was approved by the FDA for progressive GMB in April 2011. The current Phase 3 trial is testing the efficacy of the NovoTTF-100A as an adjuvant treatment with the standard of care in newly diagnosed GBM patients.

"It has been shown that low-intensity, intermediate frequency electric fields stunt the growth of tumor cells," says principal investigator Jay-Jiguang Zhu, M.D., Ph.D., a fellowship-trained neurologist and neuro-oncologist at MNI and an associate professor in the Vivian L. Smith Department of Neurosurgery at The University of Texas Health Science Center at Houston (UTHealth) Medical School. "The device, which is portable and battery-operated, is designed to administer alternating electric fields to the region of the malignant tumor by means of insulated surface electrode arrays."

After an initial six-week course of brain radiation and daily temozolomide, an oral chemotherapy agent, participants in the trial wear the device for two years while continuing the standard chemotherapy regimen of temozolomide five days out of every 28. Four pads, each of which contains nine electrodes, cover the participants' heads. They wear the pads for three days, then remove them, wash and shave their heads, and apply a clean set of electrodes.

Thirty patients will be enrolled at the MNI study site; to date, eight patients have been enrolled. The course of study is up to 24 months or the progression of the tumor. Enrollment at the MNI site will end when the enrollment goal is reached, which is expected to occur in mid-2013. The study will continue until the last patient enrolled has worn the device for two years. The estimated completion date for the trial and release of results is 2015.

A Randomized, Double-blind, Placebo-controlled Phase 2B Study of the Safety and Efficacy of ICT-107 Vaccine in Newly Diagnosed Patients with Glioblastoma Multiforme (GBM) Following Resection and Chemoradiation

PRINCIPAL INVESTIGATOR: JAY-JIGUANG ZHU, M.D., PH.D.

ICT-107 is an autologous vaccine consisting of the patient's own immune-system dendritic cells, isolated from blood and pulsed with synthetic peptides from six preselected tumor and cancer stem cell-associated antigens. Once sensitized, the dendritic cells are returned to the patient by subcutaneous injection. Researchers expect the sensitized dendritic cells to attack the tumor.

Under the direction of principal investigator Jay-Jiguang Zhu, M.D., Ph.D., a fellowship-trained neurologist and neuro-oncologist at MNI and an associate professor in the Vivian L. Smith Department of Neurosurgery at The University of Texas Health Science Center at Houston (UTHealth) Medical School, researchers are studying the efficacy and safety of ICT-107 vaccine therapy in patients with newly diagnosed glioblastoma multiforme through a multicenter trial.

"The study is designed to compare overall survival and progression-free survival in patients when treated with vaccine versus a placebo control, in addition to the standard of care for GBM – radiation therapy and temozolomide chemotherapy," Dr. Zhu says. "In addition to determining the efficacy and safety of ICT-107, we will study the immune response in patients treated with the vaccine."

The clinical trial will enroll 25 adult participants with newly diagnosed GBM who have had gross tumor resection. A total of 130 subjects will be enrolled at several study sites around the country.

Dr. Zhu expects the trial to close at the end of 2012. "We have enrolled 14 patients to date, and they tolerated the vaccine well. We expect to have more conclusive results next year."

Study of Verubulin with Radiation Therapy and Temozolomide in Subjects with Newly Diagnosed Glioblastoma Multiforme (GBM)

PRINCIPAL INVESTIGATOR: JAY-JIGUANG ZHU, M.D., PH.D.

In this Phase 1/2 study, Jay-Jiguang Zhu, M.D., Ph.D., and his team were determining the safety and tolerability of the drug verubulin, a novel chemotherapeutic agent, in combination with standard-of-care treatment – radiation therapy and temozolomide – in patients newly diagnosed with GBM. The trial, which started in 2011, was ended early due to a strategy change by study sponsor Myrexis.

Four patients were enrolled before the study was stopped: two at the Mischer Neuroscience Institute and two at Stanford University Medical Center in California. All four patients finished the six-month trial as proposed, and all tolerated the drug well.

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