

WINTER 2005

# ways AND means

METHODIST REHABILITATION CENTER

# RESEARCH EDITION

**BRIDGING THE GAP: TRANSLATING EMERGING  
DISCOVERIES INTO CLINICAL PRACTICE**

■ Clinical management of  
neuromedical complications

■ Development of new methods for  
assessment of neurological injury

■ Evaluation of new therapeutic  
approaches for motor and cognitive impairments





“ In a short period of time, we’ve established a state-of-the-art neuroscience research center and recruited a team of dedicated researchers from all over the world who have secured funding sources and had their work published in some of the most prestigious journals. As our team works to translate emerging discoveries into clinical practice, a partnership has been formed between patients and investigators, one that provides clinicians with the best possible evidence to consider when evaluating or modifying practices in neurological rehabilitation.”

Mark A. Adams  
President and Chief Executive Officer  
Methodist Rehabilitation Center

## Center for Neuroscience and Neurological Recovery

Clinician-scientists at the Center for Neuroscience and Neurological Recovery at Methodist Rehabilitation Center translate basic neuroscience research into useful therapies that benefit patients suffering from neurological illnesses and injuries. The funding sources for their projects include federal agencies, mainly the National Institute for Disability and Rehabilitation Research (NIDRR), pharmaceutical and medical equipment industry grants, state organizations, the Wilson Research Foundation and other private foundations, and the hospital itself.

## The Wilson Research Foundation

The Wilson Research Foundation was established in 1989 to improve the lives of the physically disabled through research in medical, educational and clinical applications and to complement the mission of Methodist Rehabilitation Center. A generous gift from the H.F. McCarty, Jr. Family Foundation helped establish WRF to honor Earl and Martha Wilson’s service to the physically disabled in Mississippi. Earl Wilson was the founding chairman of Methodist Rehabilitation Center.

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Methodist Rehabilitation Center provides comprehensive medical rehabilitation programs for people with spinal cord and brain injuries, stroke and other neurological and orthopedic disorders. The 124-bed state-of-the-art hospital in Jackson is one of only 16 hospitals in the country designated as a Traumatic Brain Injury Model System by the National Institute on Disability and Rehabilitation Research and is only one of two in the state accepted into the prestigious Council of Teaching Hospitals. In 2000, it became the first Mississippi hospital to be named one of America's best hospitals by U.S. News and World Report.

**Mission Statement** | In response to the love of God, Methodist Rehabilitation Center is dedicated to the restoration and enhancement of the lives of those we serve. We are committed to excellence and leadership in the delivery of comprehensive services.

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# THE Challenge



Progress in medicine requires translation of emerging discoveries into clinical practice. Bridging the gap between basic science and clinical practice has been challenging for the developing field of neurological rehabilitation, however, due in large part to the complex nature of neurological injury. Nevertheless, people with stroke, spinal cord or brain injury and their families have high hopes and expectations of the research community developing innovative treatments for improving function and quality of life. Such prospects provide compelling incentive and justification for our research efforts.

Although the field of neurological rehabilitation is expanding, the effectiveness of innovative therapeutic strategies developed thus far has been limited. Few promising treatments in animal studies show compelling results when tested in humans. While perhaps discouraging, these challenges test the determination of investigators and patients to sustain and expand human research. In this endeavor, patients and investigators form a partnership, with our patients contributing to knowledge by electing to participate in studies that they hope will benefit themselves or others like them. On the other side, clinician-scientists need to strengthen partnerships with laboratory scientists to provide them with critical feedback for future research based on clinical observations. In other words, the fast track from bench to bedside is a two-way street, open to multi-disciplinary clinicians and researchers.

A central mission of the Center for Neuroscience and Neurological Recovery at Methodist Rehabilitation Center is to provide objective evidence about what works for whom, when and why, whether we are evaluating new promising therapies or challenging embraced clinical practices. We hope that our research will provide clinicians with the best possible evidence to consider when evaluating or modifying practices in neurological rehabilitation.

This issue of Ways & Means highlights some of the current research projects at the Center for Neuroscience and Neurological Recovery and its lead investigators. The presented works span a spectrum of applications, including clinical management of neuromedical complications, development of new methods for assessment and characterization of motor, behavioral, or cognitive consequences of neurological injury, and evaluation of new therapeutic approaches for motor and cognitive impairments. The funding source for projects includes federal agencies, mainly the National Institute for Disability and Rehabilitation Research (NIDRR), pharmaceutical and medical equipment industry grants, state organizations, The Wilson Research Foundation, other private foundations and the hospital itself. The total amount awarded exceeds \$6 millions since the center was established in 1998. Our efforts would be fruitless without this support, persistence, and partnership with our patients.

**Dobrivoje S. Stokic, MD**  
Director, Center for Neuroscience  
and Neurological Recovery  
Methodist Rehabilitation Center

**Mark A. Adams**  
President and Chief Executive Officer  
Methodist Rehabilitation Center



# Traumatic Brain Injury<sup>(TBI)</sup>

As one of only 16 Traumatic Brain Injury Model System Sites in the United States, Methodist Rehabilitation Center researchers are part of a national effort to improve all aspects of TBI treatment – from acute care to community re-entry.

It's a lofty goal made more tangible by their intimate understanding of the struggles associated with TBI. "We are a site where researchers also treat patients, which we think is an advantage," explains Dr. Mark Sherer, director of neuropsychology at Methodist and TBI Model System Project Director for Mississippi. "We study what patients and families are concerned about."

Reflecting that emphasis are several current projects, which are described in the following pages.



# New Test Links Confusion

## to Broader Array of Behaviors

**W**hen people experience confusion after a traumatic brain injury, it's typically blamed on memory lapses or disorientation.

But researchers at Methodist Rehabilitation Center found that a variety of factors are associated with the condition, from nighttime sleep disturbance to daytime restlessness. That discovery led to the creation of the Confusion Assessment Protocol (CAP), a more comprehensive and objective means of evaluating patients with confusion.

Dr. Mark Sherer, director of Methodist's neuropsychology department, said the test focuses on seven symptoms: disorientation, cognitive impairment, restlessness, fluctuation in presentation, nighttime sleep disturbance, decreased level of daytime arousal and psychotic type behaviors such as delusions or hallucinations.

Patients who have four or more of the symptoms are considered to be in a post-traumatic confusional state.

Sherer said it's important to accurately diagnose the condition because confused patients are a vulnerable population. "They

have a greater risk of injury because they don't understand safety precautions. They also are a greater risk to the staff because they might intentionally or unintentionally do something to injure a staff person."

Confused patients also are more likely to require institutional placement after they leave the hospital.

Sherer said CAP came about because Methodist staff needed a more encompassing measuring tool for their own research on confusion. As one of 16 centers in the nation selected as a traumatic brain injury model system site by the National Institute on Disability and Rehabilitation Research, Methodist conducts a variety of studies designed to improve rehabilitation outcomes.

"Our main study is a medication trial, where we have people randomly assigned to receive the medicine or a placebo," Sherer said. "In three or four years, we'll know if this medicine improves recovery."

Methodist researchers also are working to identify specific clusters of behavior associated with confusion. "There are two main patterns," Sherer explained.

"One group is more likely to be restless, easily frustrated and have symptoms like hallucinations. Others are hypo-aroused. You have to wake them up, and they have difficulty cooperating with therapy because they are so sleepy. By having a better understanding of these patterns we hope to be able to predict who will respond better to different types of medicine."

Sherer said the studies being conducted at Methodist reflect the true concerns of people with TBI because they're inspired by the actual experiences of patients and their families.

"We're doing the study on acute confusion because at present there is no standard way of treating patients with confusion Dr. Sherer said. "What we learn will contribute to a better understanding of how to treat these patients and will benefit our patients and patients all over the country and the world." ■

# Study Asks Whether Severity of Impaired Self-Awareness

## Can Predict Patient Outcome

Impaired self-awareness – the inability to judge one’s own capabilities – is a frequent companion to traumatic brain injury and a common stumbling block to recovery.

That’s why Methodist Rehabilitation Center researchers are striving to learn more about the condition and its effect on the future of TBI survivors.

Dr. Mark Sherer, director of Methodist’s neuropsychology department, said the team is investigating how the extent and duration of a patient’s impaired self-awareness affects long-term outcome. It’s exploring which characteristics of brain injury seem to be associated with the most severe forms of impaired self-awareness.

“We are looking at the area of the brain affected, the numbers of bruises within the brain and the overall amount of brain that was injured,” Sherer said. “Previous research suggests that injuries to the front and right side of the brain are more related to impaired self-awareness.”

Sherer said the research team ultimately hopes to help health care workers predict which patients are more likely to suffer from

impaired self-awareness and to provide better therapies for treating the condition.

In the meantime, the team already has furthered understanding of the condition by developing a more objective means to assess impaired self-awareness.

Dr. Sherer is the lead author of the Awareness Questionnaire, a scale available on the Center for Outcome Measurement in Brain Injury Web site that is being used by researchers across the nation. “It has been downloaded thousands of times,” said Sherer. “I get calls from people all around the world asking questions.”

The AQ consists of 3 forms; one form is completed by the person with TBI, one by a family member/significant other, and one by a clinician familiar with the person with TBI. The self-rated and family/significant others forms have 17 items, while the clinician form has 18 items. On each form, the abilities of the person with TBI to perform various tasks post- injury as compared to pre-injury are rated on a five-point scale ranging from “much worse” to “much better.”

The AQ takes about 10 minutes to

administer. It is generally administered by a clinical neuropsychologist, but can be administered by personnel trained to do so.

Sherer said studying impaired self-awareness is important because of its prevalence and its effect on patient outcome.

In a study of 66 post-acute TBI patients, Sherer and his fellow researchers found that, depending on the method of measurement, 76 to 97 percent of patients showed some degree of impaired self-awareness. And those with the highest levels of impairment were less likely to be employed.

Sherer said a person’s level of impaired self-awareness can have a profound effect on performance during therapy.

People who are unaware of their deficits often resist therapy because they’re convinced they don’t need it, he explained. And others put themselves and others in danger by misjudging their capabilities. “They might be tempted to participate in activities that are not safe – such as cooking or returning to work,” he said. ■



# Therapeutic Alliances

Dr. Clea Evans, a co-investigator for the therapeutic alliance project, is studying the impact of interactions between staff, patients and their families.

## Investigating Their Impact & Seeking Improved Interventions

**W**orking closely with patients and their families is an integral part of caring for people with traumatic brain injuries. How the quality of that dynamic affects the long-term outcome of brain injury patients is the topic of a study being conducted by Methodist Rehabilitation Center researchers Dr. Mark Sherer, Dr. Clea Evans, and Dr. Risa Nakase-Thompson.

Methodist neuropsychologist Dr. Clea Evans said the research focuses on family members, clients and staff involved in Quest, Methodist's community reintegration program for people with brain injuries.

Dr. Evans said psychotherapists use the term therapeutic alliance to describe the bond between clients and therapists and how well they work together on the tasks and goals of therapy.

Previous studies have shown a link between strong alliances and treatment gains in psychotherapy. Now Methodist researchers hope to confirm whether such alliances can help predict a client's ability to achieve a variety of goals, including community reintegration, personal independence and productivity in rehabilitation after brain injury.

At this point, there has been only very limited investigation of the impact of therapeutic alliance in brain injury rehabilitation. This study will be the first investigation of an intervention designed specifically to improve therapeutic alliance, Dr. Sherer said.

A primary focus of the study will be how families and the clients themselves perceive their functional abilities.

"Our previous research has shown that these perceptions often vary widely, and we believe these differences affect the interactions between clients, family and staff," Dr. Sherer said. "When clients do not perceive that they have problems that family members and therapists are concerned about, they may not be motivated work on therapy tasks designed to address these problems. Some clients may resent being confronted about problems they do not think they have. This resentment can be a further barrier to progress in therapy. If therapeutic alliance between clients and therapists can be improved, this resentment can be overcome and progress can be made in therapy."

The study also will explore the attributes of the clients, families and therapists and the characteristics of the program to determine which factors contribute to strong alliances. Improved understanding of these attributes will lead to the development of an intervention designed to improve working alliances. As a part of this investigation, Methodist researchers will conduct a trial of the effectiveness of this intervention.

"The findings of this study should provide guidelines to help us develop therapeutic tasks and program structures and improve the nature of staff interactions with clients and families," Dr. Evans said. ■

From left, Dr. Robert Hirko, Dr. Dobrivoje Stokic and Tony Hayes evaluate the fit of a navigational device designed to ensure the precise delivery of transcranial magnetic stimulation.



## Study Evaluates Use of

# Transcranial Magnetic Stimulation

## to Characterize Motor Disorders in Traumatic Brain Injury Patients

**T**ranscranial magnetic stimulation (TMS) has long helped researchers identify changes in the brain that contribute to motor deficits in neurological conditions such as dystonia, Parkinson's disease and stroke.

Now researchers at Methodist Rehabilitation Center are using this safe, painless and non-invasive method of mapping the brain to study another population plagued by motor impairments -- traumatic brain injury (TBI) patients.

Although it's often underreported, motor dysfunction can be a major cause of disability for TBI patients, said Dr. Dobrivoje Stokic, director of Methodist's Center for Neuroscience and Neurological Recovery (CNNR).

"It can limit their coordination, dexterity, gait and balance," he said. "Since many patients who suffer from spasticity, dystonia, tremor, bradykinesia or ataxia after TBI do not respond well to prescribed medications or physical therapy, we need to find alternative therapies."

"Few studies have explored the utility of transcranial magnetic stimulation after TBI," he added. "We hope that by using

TMS, we'll gain a better understanding of the underlying causes of motor dysfunction and lay the groundwork for developing more timely, efficient and individualized therapies for TBI patients."

The CNNR study is a four-year project that will ultimately include about 60 people. Stokic said researchers will be recruiting people with TBI who were injured more than a year prior to this study. Participants will undergo a clinical evaluation, several different TMS studies and be tested in the hospital's Motion Analysis and Human Performance Lab.

During the TMS evaluation, a special coil generates magnetic field impulses that stimulate underlying nerve cells in the brain. Because the coil must be precisely positioned on each participant's head, Stokic said study investigators teamed with Methodist's biomedical engineering department to develop a navigational device that ensures proper and consistent placement of the coil.

Stokic said it might turn out that the emerging therapies for Parkinson's and other movement disorders prove helpful to TBI patients. But first it is important to characterize TBI-related

motor dysfunction and associated motor cortex changes and determine how these changes relate to the type and severity of the patient's motor impairments.

Once that's accomplished, Methodist researchers hope to begin studying whether a therapy known as repetitive transcranial magnetic stimulation (rTMS) might benefit people with TBI-related motor dysfunction.

During rTMS, the magnetic stimulator continuously delivers multiple pulses to the brain. Stokic said the therapy appears promising in the treatment of Parkinson-related bradykinesia, different forms of ataxia and dystonias.

"Since these very same signs and symptoms of movement dysfunction may be associated with TBI, we want to see whether rTMS might help the TBI population, as well. Our first goal is to better characterize motor dysfunction after TBI and determine potential candidates for this rTMS intervention. We also want to study if it's feasible and safe to apply rTMS in brain-injured persons and whether rTMS has any measurable effect on motor cortex functions and motor performance." ■

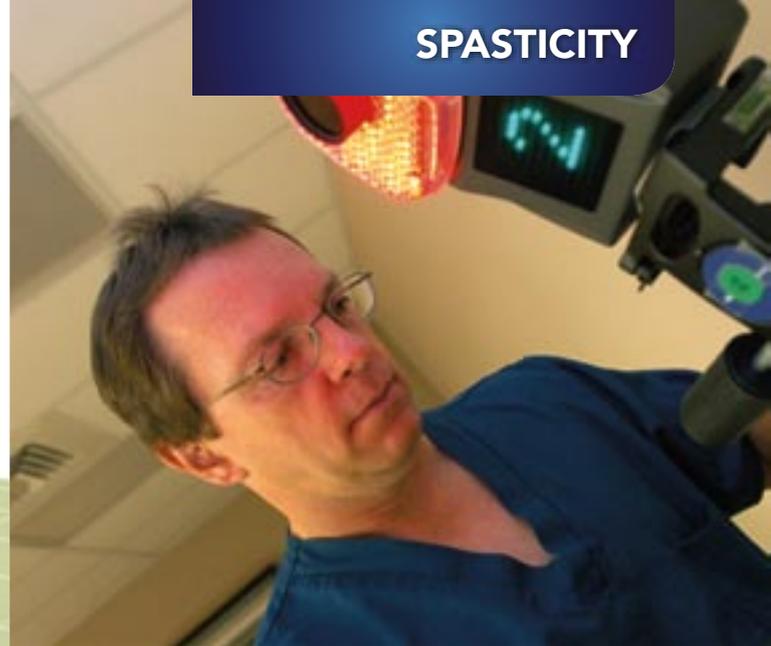
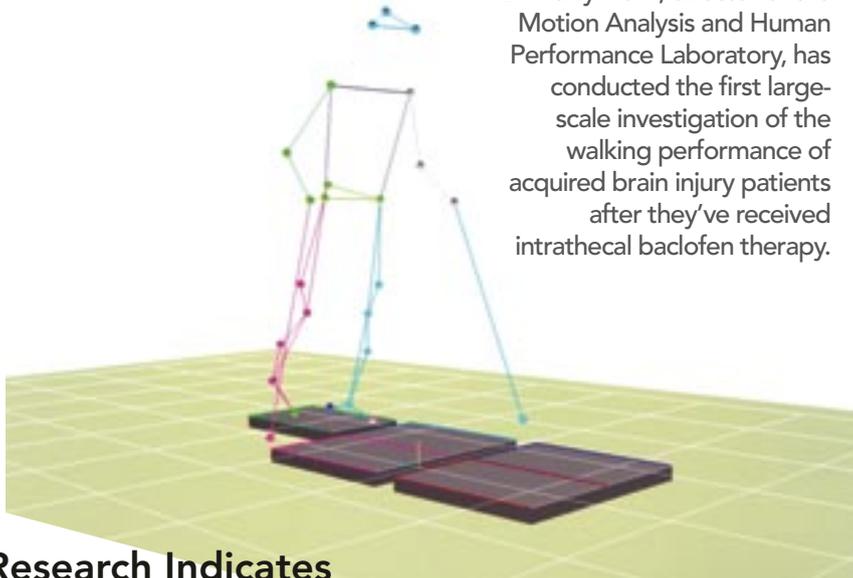
# Spasticity

Spasticity preys on thousands of people whose nervous systems have been damaged by neurological disorders.

At its worst, it can cause crippling muscle spasms, making the quest for successful treatments a pressing concern of rehabilitation research.

Methodist Rehabilitation Center is contributing to the cause via a variety of studies to help health care workers assess and fine-tune various therapies for the condition. Following are profiles of those projects.

Dr. Terry Horn, director of the Motion Analysis and Human Performance Laboratory, has conducted the first large-scale investigation of the walking performance of acquired brain injury patients after they've received intrathecal baclofen therapy.



Research Indicates

# Gait Analysis

Useful Measure for Quantifying Effects of Intrathecal Baclofen Therapy

Computerized gait analysis is a high-tech tool that is used for a variety of purposes – from evaluating the biomechanics of elite athletes to identifying optimal surgical strategies for cerebral palsy patients.

Now a Methodist Rehabilitation Center study has shown it is also an objective way of assessing the effects of intrathecal baclofen (ITB) therapy on gait in patients with spasticity due to acquired brain injury (ABI).

Dr. Terry Horn, director of the Methodist's Motion Analysis and Human Performance Laboratory, said the study, which was partially funded by a research grant from Medtronic Inc., involved 28 subjects who were candidates for ITB therapy for spasticity related to stroke, anoxia or a traumatic brain injury.

Dr. Horn used the lab's six-camera system to capture the movements of patients as they walked at their preferred speed during test sessions prior to the ITB bolus injection, and at two, four and six hours afterwards. The resulting motion data were analyzed to

determine the peak effect of ITB on velocity, stride length, cadence, and other time- and distance-based gait characteristics.

Physical therapists also performed a hands-on physical exam of each patient's lower extremity muscles. The exam – coupled with the patients' own interpretations of their response -- has been the traditional means of evaluating the effects of ITB.

But Dr. Horn said both are subjective measures, which don't always give a complete picture of patient response.

"Based upon our clinical experience, we know that ITB bolus injection consistently reduces lower extremity muscle stiffness, although not every patient improves in walking performance," he said. "When you ask patients how they feel, the majority say they feel better, but weaker. It's difficult to assess the efficacy of the drug without a functional test."

Computer-assisted motion analysis, on the other hand, carries with it no such subjectivity and can pinpoint even minor changes in a patient's gait

pattern. With the aid of this technology, Dr. Horn and his colleagues found that patients with faster baseline walking speed were more likely to demonstrate improvements in walking ability after ITB bolus injection. This suggests that a simple timed walk test may be used to effectively supplement traditional clinical assessment during ITB bolus screening.

Dr. Horn said the study is the first large-scale investigation of walking performance after ITB bolus injection in ABI patients. The results have recently been accepted for publication in the journal *Archives of Physical Medicine and Rehabilitation*.

"Our next step is to similarly assess those patients who subsequently underwent ITB pump implantation. Ultimately, we would like to determine whether walking performance during the bolus trial, as measured by computerized gait analysis, is related to long-term changes in gait occurring with continuous ITB infusion. We hope to be able to develop a predictive model for identifying which patients are most likely to benefit from the ITB pump." ■

# H-REFLEX RESEARCH

## Suggests Technique May Help Physicians Monitor Intrathecal Baclofen Therapy

Intrathecal baclofen (ITB) therapy brings welcome relief to many who suffer from the painful spasms and abnormal postures associated with spasticity. But fine-tuning the drug's effect has long been a struggle for physicians.

"The problem is we've never established an objective way to monitor the spinal cord's responsiveness to the drug," explained Dr. Dobrivoje Stokic, director of the Center for Neuroscience and Neurological Recovery at Methodist Rehabilitation Center. "Traditionally, we've turned to tools such as the tendon reflex scale, the Ashworth scale and spasm frequency scale for evaluations, but they have clear limitations when used as an index of ITB response."

Researchers at Methodist hypothesized that a better measure might be obtained by adding a neurophysiological technique known as H-reflex to the standard ITB evaluation. And that belief has been borne out by a more than two-year study on patients implanted with baclofen pumps for dysfunctional spasticity due to acquired brain injury.

"We feel that H-reflex has proved clinically useful in a variety of ways," said Dr. Stuart Yablon, medical director of Methodist's brain injury program. "We can use it to objectively confirm ITB bolus trial responses, to help adjust ITB during the early post-implant phase, to evaluate suspected system malfunctions, such as catheter problems and 'low reservoir

syndrome,' and to confirm favorable response to a change in mode of ITB administration."

Often described as the electrical equivalent of the tendon tap, H-reflex is most commonly evoked by stimulating the tibial nerve behind the knee and recording electrical signals from the calf muscles, Stokic said. "The amplitude ratio between maximum H-reflex and maximum M-wave (H/M ratio) has been considered an index of spasticity because, in the majority of patients with spasticity, the H/M ratio is increased above normative limits."

During the first part of the study, patients underwent clinical and H-reflex evaluations before and after an ITB bolus trial. "We found that regardless of its initial size, H/M ratio after ITB bolus injection uniformly decreased to below 10 percent of baseline," Stokic said. "Among patients who proceeded with the pump implant, we observed a dose-dependent effect of ITB on H/M ratio. The doses from 100 to 250 micrograms per day in simple continuous mode are sufficient to reduce H/M ratio to about 10 percent of baseline. Further increases in ITB dose completely abolished the H-reflex. This is consistent with previously published reports in other patient groups."

To monitor long-term delivery of ITB, H-reflex is typically recorded each time a patient returns to Methodist Rehab for follow-up or pump refill. Based on accumulated data, the researchers have identified several useful applications of the H-reflex among patients treated with ITB for spasticity.

Yablon said H-reflex sensitivity is particularly useful during the early titration phase since changes in H-reflex often herald a dose when clinical response is about to be observed. "We now progressively increase the dose until changes in H-reflex are observed, then, dose increases are more gradual as the desired clinical response is reached," he said. "A lack of expected H-reflex change, despite aggressive dose adjustments, serves as an objective indicator of probable system malfunction, even early after pump implantation. In the event of apparent loss of drug effect or abrupt worsening of spasticity, an increase in H/M ratio may serve both as a forewarning and as a reliable confirmation of a potential problem." Stokic said the H-reflex technique has an advantage over clinical assessment in terms of control of stimulation parameters and objective evaluation of responses. "The H-reflex recording is simple and easily performed, requiring minimal patient participation and causing almost no discomfort. In addition, the measurements are stable and reproducible under controlled conditions, which facilitates objective quantification and comparison. In our opinion, neurophysiological evaluation is useful for assessing spinal cord responsiveness, and if available, this information should be considered when judging the overall clinical effectiveness of ITB administration." ■



Dr. Dobrivoje Stokic and Tony Hayes appraise the data gathered during a two-year study of patients implanted with baclofen pumps for dysfunctional spasticity due to acquired brain injury.

MULTI-CENTER

# Collaborative

SPASTICITY STUDIES

DR. STUART YABLON, MEDICAL DIRECTOR OF METHODIST'S BRAIN INJURY PROGRAM—PRINCIPAL INVESTIGATOR  
PAULA RUSSUM, RESEARCH NURSE—PROJECT COORDINATOR

**ALLERGAN BOTOX STUDY.** This is a multi-center, open-label study of the safety of repeated doses of BOTOX (Botulinum Toxin Type A) purified neurotoxin complex for the treatment of focal upper limb post-stroke spasticity. The study will include approximately 260 subjects in North America with medically stable post-stroke hemiplegia with spastic muscles in the upper limb that manifest common patterns of upper motor neuron dysfunction. ■

**MEDTRONIC BACLOFEN PUMP STUDY.** This is a multi-center study investigating the administration of baclofen injection for the management of spasticity associated with stroke. The objective is to evaluate functional changes as a result of ITB therapy in the stroke population, obtain additional data on the safety and efficacy of baclofen injection delivered during an intrathecal screening bolus and chronic intrathecal infusion via the Synchronomed Infusion System to patients with spasticity associated with stroke, and evaluate quality of life changes as a result of ITB therapy in the stroke population. ■

**BOTOX VS. ZANAFLEX SPASTICITY STUDY.**

This is a multi-center, randomized, prospective, parallel, double-blind, placebo-controlled trial of BOTOX versus Zanaflex for the treatment of subjects with post-stroke upper limb spasticity. The purpose is to evaluate the safety and efficacy of BOTOX compared to Zanaflex in reducing increased upper limb muscle tone in post-stroke subjects and to evaluate changes in muscle tone-related disability and drug-therapy tolerance. Principal investigator and study sponsor is Dr. David Simpson, MD, of the Mount Sinai School of Medicine in New York. ■



A videophone helps research nurse Paula Russum stay in touch with participants in the THANKS (Transitioning Home and Acquiring Necessary Knowledge about Self-Care) study.

# Phone-based EDUCATION

## and Support Program May Help Spinal Cord Patients Prevent Complications

The recent death of actor and activist Christopher Reeve not only highlighted how vulnerable spinal cord injury (SCI) patients are to secondary complications, it also reinforced the value of a recent pilot study conducted by researchers at Methodist Rehabilitation Center.

Funded by the Mississippi Department of Rehabilitation Services, THANKS (Transitioning Home and Acquiring Necessary Knowledge about Self-care) examines whether post-discharge education and support might prevent complications, improve the quality of life and reduce long-term health care costs for SCI patients.

The THANKS program is administered via the telephone and is designed to monitor understanding of SCI-related self-care, to reinforce skills learned in

rehabilitation and to provide ongoing access to health care specialists.

“The program starts the week after they’re discharged,” said Methodist research nurse Paula Russum, the co-investigator for the project. “I call them once a week for four weeks, every other week for another four weeks and then monthly for four months, for a total of 10 visits. The program includes 10 education modules, and during the last call I do a comprehensive review of all the information and a final exam.”

Among others, topics addressed include autonomic dysreflexia, circulatory system complications, respiratory care, range of motion exercises, mobility and positioning, bladder and bowel management and skin care. More than 70 participants ages 15 to 80 took part in the first year study.

Russum said results of the study so far are encouraging. “Our preliminary findings show marked improvement in self-care knowledge over time and the participants highly recommended and commended the THANKS program. One woman said the program made her feel more at ease and more aware of things she needed to know.”

Russum believes participants benefited from the program because they’re more receptive to self-care education once they’re at home. “They are just so overwhelmed in the hospital. There is so much new information coming at them that they don’t have time to absorb it all.”

The THANKS program will continue to enroll new participants in the study, as well as monitor those who’ve already completed the education modules, said Dr. Dobrivoje Stokic, director of the Center for Neuroscience and Neurological Recovery and the THANKS study’s principal investigator. “We will conduct a one-year follow-up with people enrolled in the first year of the study to find out about secondary complications and determine their satisfaction with life, perceived health, employment status, adjustment to injury and community reintegration.”

While Russum believes the program is a feasible means of helping patients manage their health, she does say it requires commitment of time, resources and energy. “I made 696 phone calls over the course of one year. I have been told by several of my patients that I must be a detective because I have had to search for many people who had moved from their primary address.”

The reaction of the participants made all the hard work worthwhile, she said. “One woman said she didn’t think she would have made it through without my help.” And another participant credited Russum with helping him recognize symptoms of dysreflexia – a possibly life-threatening condition. ■

# Biomedical ENGINEERS CRAFT TOOL

## to Study Forces that Cause Pain, Injuries for Wheelchair Users

Propelling a wheelchair day after day can take a toll on the arms and shoulders.

To better understand the forces behind this wear and tear, Methodist Rehabilitation Center's assistive technology staff joined with Mississippi State's biological engineering program to design what they call the IntelliWheel System.

The system consists of two parts. The first is a wheelchair wheel designed to sense the magnitude, strength and orientation of forces that the user applies to the wheel's pushrim. The second is a stationary platform, similar in function to a treadmill, which allows researchers to gather data while wheelchair users roll in place on a variety of simulated surfaces.

"The system can be used to measure and study the biomechanics of wheelchair propulsion and help us understand the causes of pain and injury in wheelchair users," explained John Ramshur, biomedical engineer for the Methodist's Motion Analysis and Human Performance Laboratory. "We'll be able to compute resultant force, radial, tangential and axial forces and moments, acceleration/rate of rise, stroke frequency per second, velocity, stroke length and distance traveled."

Ramshur said the wheel comes equipped with a wireless high-speed communication link and onboard memory and can be attached to a standard wheelchair.

"This set-up allows us to gather real-time data in a variety of settings," he said. "Wheelchair users can roll across grass or pavement or other surfaces typical of their environment, while



Biomedical engineer John Ramshur uses an innovative wheelchair wheel coupled with computerized motion analysis to study the biomechanics of wheelchair users.

the wheel measures factors such as stroke length, frequency and speed."

Coupled with the stationary platform, the wheel also can be used in a clinical setting. "The platform features two independent rollers for each left and right wheel," explained Ramshur. "To simulate different grades and slopes, the platform will be able to tilt in multiple directions. To simulate surfaces that a typical wheelchair user may encounter everyday, we will have multiple rollers with various surfaces attached."

Used in conjunction with the motion lab's eight-camera motion-capturing system, the IntelliWheel System can help researchers collect data that can be translated into a sophisticated computer model of each wheelchair user's biomechanics.

"If we collect the IntelliWheel data simultaneously with data captured with our Motion Analysis system, we can translate the forces applied to the rim into forces and moments at wrist, elbow, and shoulder joints," Ramshur said.

Armed with John's information, therapists will be able to pinpoint problem areas for clients and suggest ways to more efficiently propel their chairs.

They also should be better able to recommend the best style of wheelchair for a particular user, Ramshur said. "This same data also will be helpful in justifying the choice of chairs for insurers. It can show why a person might need a power-assist model, rather than a manual chair." ■



Dr. Dongchul Lee, research associate, demonstrates how a mathematical model that he created can help assess motor function in spinal cord injury patients.

# Mathematical Model

## Aids in Assessing Spinal Cord Injury Motor Functions

Assessing the extent of a spinal cord injury is seldom easy, particularly in the area of motor function.

“It’s quite complicated due to the variety of motor symptoms and signs, such as weakness spasticity and involuntary movements,” said Dr. Dobrivoje Stokic, director of the Center for Neuroscience and Neurological Recovery at Methodist Rehabilitation Center.

While measures such as the American Spinal Cord Injury Association (ASIA) impairment scale provide a standard method of classifying the level and severity of SCI, it doesn’t offer fine details about the way muscles are activated and used in conjunction with one another. It also lacks sensitivity to relevant motor control issues, such as timing and distribution of muscle activity.

In comparison, recording surface EMG during voluntary motor tasks can quantify the nervous system output to muscles. It also offers insight into the brain and spinal cord control that initiates, sequences, and coordinates muscle activity associated with intended movement.

Stokic said such measurements would be enhanced by a comparison to activation patterns in neurologically healthy individuals. And a recent research at Methodist is making that possible by the application of a mathematical model for quantitatively analyzing and recognizing surface EMG patterns of muscle activity during the performance of different motor tasks.

Designed by Dr. Dongchul Lee, a PhD research associate at CNNR, the method makes it possible to objectively quantify the degree to which a patient’s motor profile on a given task is similar to neurologically healthy subjects.

The mathematical model has two components: The EMG magnitude expresses the total activity or energy during the movement. The similarity index compares muscle activity recorded during a patient’s voluntary movements to a prototype pattern derived from a neurologically healthy subject.

Lee said these elements are important since alterations in motor control after SCI commonly affect both of these measures.

“Preliminary studies indicate that the model can successfully distinguish motor performance of ASIA C compared to ASIA D SCI subjects. The method is also able to pick up the changes associated with the withdrawal of spasticity medication or due to therapeutic intervention.”

Full research and clinical utility of this method remains to be demonstrated in larger studies, Stokic said.

“We plan to determine how well the model tracks changes that occur with spontaneous recovery after SCI, due to a variety of therapeutic interventions, or worsening of functions due to evolving complications. We hope that this method will increase our sensitivity when evaluating innovative therapeutic interventions, thus providing deeper insight into changes not readily observed by clinical scales. Such findings may guide other researchers toward refining and developing therapeutic strategies for improving motor functions after SCI.” ■

# Study Suggests Bed Rest not the Primary Cause of Deep Vein Thrombosis in Brain Injury Patients

**P**rolonged bed rest is often blamed for deep vein thrombosis (DVT), a dangerous condition that affects as many as 54 percent of patients in acute care hospitals.

But a more than four-year study by researchers at Methodist Rehabilitation Center suggests other factors seem more important for developing DVT after brain injuries.

“While increased DVT risk among patients with brain injury is often associated with impaired mobility, our study of 709 patients found limited support for these assertions,” said Dr. Stuart Yablon, medical director of Methodist’s brain injury program. “None of 42 patients with a ‘supervision’ level of ambulation at admission had ultrasonographic evidence of DVT. Similarly, no DVT was found among 80 traumatic brain injury patients with at least a ‘minimal contact assistance’ level of ambulation at admission.”

Yablon said the goal of the study was to determine the prevalence and risk factors of DVT among neurorehabilitation admissions for brain injury and to evaluate whether there is a correlation between ultrasonography and D-dimer assay, a specific marker of hemostasis activation.

The research is needed, said Yablon, because few studies address the prevalence and risk factors of venous thromboembolic disease, including DVT and pulmonary embolism, after acquired brain injury.

“The incidence of DVT in the acute care



Dr. Stuart Yablon collected data on more than 700 patients with acquired brain injury to determine factors that influence their risk of developing deep vein thrombosis.

hospitals has been reported as high as 54 percent,” he said. “Studies of patients with brain injury in neurorehabilitation settings report incidences up to 18 percent when asymptomatic screening is employed, and less than 2 percent for patients with symptomatic DVT.”

Patients in the Methodist study underwent proximal lower extremity venous duplex ultrasonography and D-dimer assays screening within 24 hours of their admission to the hospital.

Yablon said the results showed that overall DVT prevalence was 11 percent, and was higher in brain tumor (21 percent) and intracranial hemorrhage (16 percent) groups than after traumatic brain injury (7 percent). D-dimer assay demonstrated high sensitivity to DVT and strongly correlated with ultrasonographic evidence of DVT.

Lower extremity long-bone fractures, age, and Glasgow Coma Score were not associated with greater risk of DVT for

patients with traumatic brain injury. The identified risk factors for DVT in the overall sample included older age, type of brain injury, D-dimer assay level, and greater post-injury duration. “Interestingly, the risk factors varied with type of brain injury, only D-dimer and greater post-injury duration were associated with DVT among those who sustained brain trauma,” Yablon said.

After adjusting for other risk variables, researchers found that ambulatory function demonstrated only a trend toward significant association with DVT prevalence -- but only in the overall sample. Among those who sustained a traumatic brain injury, walking ability was not independently associated with DVT risk. “This suggests that ambulatory function in itself is not an independent risk factor for DVT among patients with traumatic brain injury,” Yablon said. ■



**VENOUS DUPLEX ULTRASONOGRAPHY** revealed occult deep vein thrombosis in the proximal lower extremity in 11 percent of all brain injured patients at the time of admission to Methodist Rehab. Deep vein thrombosis risk is multifactorial - but it is strongly influenced by the type of acquired brain injury. Ambulatory function in itself is not an independent risk factor for DVT among patients with traumatic brain injury.

Dr. Risa Nakase-Thompson describes injuries to the brain that are associated with aphasia, a communication disorder that can leave victims unable to speak, read or write.



# Researchers Develop Test to Recognize Many Facets of Aphasia

Telling time. Scanning newspaper headlines. Chatting with friends.

They're all activities that are as automatic as breathing. Yet these abilities can be taken away in a heartbeat by aphasia, a baffling condition that can leave its victims struggling to read, write, speak and understand language.

The communication disorder strikes more than 100,000 Americans a year, and its effects can be maddeningly diverse.

"You have people who recover very well with verbal communication, but are unable to read and write," said Dr. Risa Nakase-Thompson, a neuropsychologist at Methodist Rehabilitation Center in Jackson. "And you have some people who can write, but they can't read what they've written. Global aphasia is someone impaired in all communication domains. They are no longer able to express

their wants or needs, and they don't understand what you are saying to them."

In the past, aphasia's wide range of symptoms has made it difficult to pinpoint specific deficits. But a new screening test developed at Methodist is helping health care workers more readily recognize the many facets of the disorder.

Dr. Thompson said Methodist's clinical staff created the Mississippi Aphasia Screening Test (MAST) out of their own frustration with measurement tools for people with severe aphasia or unusual presentations.

"Other tests were too long or only evaluated one aspect of aphasia," Dr. Nakase-Thompson said. "We needed something fast that covered all the domains of aphasia."

The MAST has nine subtests that range from 1 to 10 items per subscale and it can

be administered in five to 10 minutes. It has been utilized with a wide variety of patient populations including traumatic brain injury, stroke, epilepsy, anoxia, dementia, and various encephalopathies.

The MAST can be downloaded from the Center for Outcome Measurement in Brain Injury (COMBI) website, and it's in high demand, Dr. Nakase-Thompson said. "The fact that we're getting questions and people are downloading it from around the world tells me there was a need."

Nakase-Thompson said the test is usually administered in front of family members, and it can be a real eye-opener. "I put objects in front of the patient and say point to the pen or the cup. When they're not able to pick out the cup, that says something to the family." ■

# Latest Study

## Looks at Link Between Initial Infection, Long-Term Outcome



Dr. Art Leis answers questions about West Nile virus for an educational video produced by the Mississippi State Department of Health.

In 2000, Methodist Rehabilitation Center researchers were the first to report that West Nile virus can attack the motor cells of the spinal cord, causing fatigue, muscle weakness and a polio-like paralysis, and the first to confirm those findings through autopsy results.

Now they've added to the base of knowledge about West Nile virus infection by researching the long-term outcome of disease survivors.

The hospital's Center for Neuroscience and Neurological Recovery (CNNR) recently finished a follow-up study on 33 West Nile virus survivors that was funded by an \$82,000 grant from the Mississippi State Department of Health and the Centers for Disease Control and Prevention. The study examined the outcome of two groups: patients who experienced muscle weakness during the acute stage of the illness and those who didn't.

"We wanted to know what kind of recovery had taken place during the year after the initial infection so that we could compare it to their evaluation soon after they were infected," said Dr. Dobrivoje Stokic, director of Methodist's Center for Neuroscience and Neurological Recovery (CNNR). "We wanted to learn to what degree that the severity of initial impairment is related to long-term outcome."

Study participants who exhibited muscle weakness were asked to answer a questionnaire and undergo extensive clinical and laboratory examinations. Participants without muscle weakness only answered the questionnaire.

Stokic said preliminary results of the study reveal that lasting fatigue affected about half of the study participants. About 1 in 5 said fatigue was severe enough to impact their daily lives.

Overall, 20 to 30 percent of participants said that aftereffects of their West Nile virus infection were causing "big problems," including limiting their outdoor activities and affecting their ability to fulfill family roles. On the positive side, muscle recovery was evident in almost all cases, and the majority of participants remained functionally independent.

CNNR senior scientist Dr. Art Leis said the study has helped identify a number of symptoms not previously associated with West Nile virus, including facial weakness, difficulty swallowing and vision problems.

Dr. Leis said that alerting other health care professionals to these more rare manifestations of the virus should help reduce what has been a common problem—doctors mistaking a patient's muscle weakness and paralysis for symptoms of stroke or Guillain Barre

Syndrome. "Treatments for those conditions are completely ineffective for West Nile virus and can cause injurious side effects," Dr. Leis said.

Study results also have underscored the need for West Nile patients to undergo a comprehensive battery of electrodiagnostic tests to determine the extent of neurological damage. "A complete neurological exam electromyography and nerve conduction studies are essential for a prognosis," Dr. Leis said. "If the virus destroys a majority of cell bodies in the spinal cord, the patient will likely have lasting profound weakness."

Stokic said the CNNR's research on West Nile virus infection is continuing via a collaboration with colleagues at the University College of London in the United Kingdom.

"We're taking samples of spinal fluid from people who suffered either from West Nile virus fever, meningo-encephalitis or polio-like paralysis and sending them to London for analysis," he said. "Our focus is on the proteins released in the cerebral spinal fluid as a consequence of injury. These biomarkers reflect damage to different parts of the nervous tissue. By studying these biomarkers, we hope to determine whether they relate to the severity of both the initial and long-term recovery." ■



## Mark Sherer, PhD

Dr. Sherer is director of neuropsychology and clinical director of the Quest program at Methodist Rehabilitation Center and project director for the Traumatic Brain Injury Model System of Mississippi. He is also a clinical professor of neurology at the University of Mississippi Medical Center. Dr. Sherer is a board certified neuropsychologist with over 20 years experience as a clinician, administrator and educator in brain injury rehabilitation. He is a fellow of the American Psychological Association and the National Academy of Neuropsychology. Prior to joining MRC, Dr. Sherer was director of neuropsychology at The Institute for Rehabilitation and Research (TIIR) and clinical associate professor of physical medicine and rehabilitation at Baylor College of Medicine in Houston, Texas. Dr. Sherer has also served as principal investigator for grants on TBI/SCI community integration and rehabilitation of brain tumor patients. He has published more than 150 articles, chapters and

abstracts including 62 peer reviewed articles and has given numerous presentations to state, national and international conferences. Dr. Sherer serves on editorial boards for *Applied Neuropsychology* and the *Journal of Head Trauma Rehabilitation*, and as an ad-hoc reviewer for *Journal of Clinical and Experimental Neuropsychology*, *Archives of Clinical Neuropsychology*, *Journal of Clinical Psychology*, *Journal of the International Neuropsychological Society*, *Archives of Physical Medicine and Rehabilitation*, *American Journal of Physical Medicine and Rehabilitation* and *Brain Injury*.

## Stuart A. Yablon, MD

Dr. Yablon is director of the Brain Injury Program at Methodist Rehabilitation Center, project medical director for the Traumatic Brain Injury Model System of Mississippi and clinical assistant professor of neurosurgery and neurology at the University of Mississippi Medical Center. He is board certified in physical medicine and rehabilitation. Dr. Yablon was previously co-director of the Brain Injury Program at The Institute for Rehabilitation and Research (TIIR) and assistant professor of physical medicine and rehabilitation at Baylor College of Medicine and the University of Texas Medical School. He also has been principal investigator or co-investigator on several funded projects related to pharmacologic therapies for TBI rehabilitation and management of spasticity. He has received numerous awards. Dr. Yablon has published over 100 articles, chapters, monographs, and abstracts and has given numerous invited presentations all over the world. He has served as an ad-hoc reviewer for *Archives of Physical Medicine and Rehabilitation*.



## Clea Cornett Evans, PhD

Dr. Evans is a staff neuropsychologist at the Quest program at Methodist Rehabilitation Center. She received a Ph.D. in clinical psychology from the University of Georgia in 1999 and completed a two-year post-doctoral fellowship in neuropsychology at Baylor College of Medicine/TIIR in 2001. She is a co-investigator for the therapeutic

alliance project that is part of the National Institute on Disability and Rehabilitation Research's Traumatic Brain Injury Model System of Mississippi grant. She is also on the faculty of the MRC/University of Mississippi Medical Center Postdoctoral Neuropsychology Fellowship Consortium. Her research interests include rehabilitation interventions and outcomes following TBI and stroke. Dr. Evans has published 28 articles and abstracts and has given numerous professional presentations at state, national and international conferences.



## Dobrivoje S. Stokic, MD

Dr Stokic is a director of the Center for Neuroscience and Neurological Recovery and director of the neurophysiology research laboratory at Methodist Rehabilitation Center. He completed his residency and master's in physical medicine and rehabilitation at the University of Belgrade, Serbia. Before joining MRC in 1997, he was a postdoctoral fellow and research associate at the Division of Restorative Neurology and Human Neurobiology at Baylor College of Medicine in Houston, Texas. His research interest is neurophysiological assessment of motor functions after stroke, spinal cord injury and brain injury as it pertains to diagnosis and evaluation of rehabilitation outcomes and interventions. Dr Stokic is a lead investigator on the transcranial magnetic stimulation project—a part of the Traumatic Brain Injury Model System of Mississippi grant. He serves as principal investigator or co-investigator on several projects funded by pharmaceutical

industry, various foundations and local agencies. Dr Stokic has published over 40 peer-reviewed articles and more than 60 abstracts presented at national and international meetings. He has served as an ad-hoc reviewer for *IEEE Transactions on Neural Systems & Rehabilitation*, *Archives of Physical Medicine and Rehabilitation*, *Muscle & Nerve*, *Clinical Neurophysiology* and the *Journal of Physiology*.



## A. Arturo Leis, MD

Dr Leis is a senior scientist at the Center for Neuroscience and Neurological Recovery, chief of medicine at Methodist Rehabilitation Center and clinical professor of neurology at the University of Mississippi Medical Center. He is certified by the American Board of Psychiatry and Neurology, with added qualification in clinical neurophysiology, and by the American Board of Electrodiagnostic Medicine. Prior to current appointments, Dr Leis was director of clinical neurophysiology at the Division of Restorative Neurology and Human Neurobiology at Baylor College of Medicine in Houston, Texas and chief of electromyography at the Department of Neurology at the University of Mississippi Medical Center. Dr Leis has received numerous honors and awards for his clinical and academic accomplishments. He has authored more than 80 peer-reviewed articles and book chapters and over 100 abstracts. He recently published *Atlas of Electromyography*. He has served as an

invited examiner for the American Board of Electrodiagnostic Medicine and has made numerous presentations at national and international meetings, courses and workshops. Dr Leis regularly serves as an ad-hoc reviewer for *Neurology*, *Archives of Neurology*, *Muscle & Nerve* and *Clinical Neurophysiology*

## Terry S. Horn, PhD

Dr. Horn is the director of the Motion Analysis and Human Performance Laboratory at Methodist Rehabilitation Center. He received a Ph.D in biomedical engineering from the University of Kentucky in 1993. Prior to joining MRC in 1998, he held an appointment in the Division of Orthopaedic Surgery at the University of Alabama in Birmingham, where he was the director of the Gait Analysis Center at the Children's Hospital of Alabama. Dr. Horn has published 11 articles and abstracts and has given numerous national and international presentations. He was also the conference chairperson for the first annual meeting of the Gait and Clinical Movement Analysis Society and currently serves on the society's accreditation committee. He also served as an ad-hoc reviewer for *IEEE Transactions on Neural Systems & Rehabilitation Engineering* and the *Journal of Neurology, Neurosurgery, and Psychiatry*.



## Risa Nakase-Thompson, PhD

Dr. Nakase-Thompson is a staff neuropsychologist at Methodist Rehabilitation Center. She earned her Ph.D in clinical psychology from West Virginia University. She has been involved at various stages of five National Institute on Disability and Rehabilitation Research (NIDRR) grants since joining MRC in 1998. She currently serves as a research coordinator and co-investigator for

therapeutic alliance and confusion treatment trials which are part of the NIDRR TBI Model System of Mississippi grant. She is also an assistant director of clinical training for the MRC/University of Mississippi Medical Center Postdoctoral Neuropsychology Fellowship Consortium. Her research interests include assessment and treatment of neurobehavioral functioning after acquired brain injury and rehabilitation of aphasia. Dr. Nakase-Thompson has published 46 articles and abstracts and has given more than 50 professional presentations at state and national conferences. She has served as an ad-hoc reviewer for *Clinical Psychology and Psychotherapy*, *Journal of Cognitive Psychotherapy*, and *Psychology and Addictive Behaviors*.



## Dongchul C. Lee, PhD

Dr Lee joined the Center for Neuroscience and Neurological Recovery at Methodist Rehabilitation Center in fall of 2004 as a research associate. He received a bachelor's degree in electrical engineering from Chung-Ang University in Seoul, Korea in 1993 and a master's degree from the University of Houston in Houston, Texas in 1997. From 1995–2000, he was a research assistant in the Division of Restorative Neurology and Human Neurobiology at Baylor College of Medicine and the Center of Excellence on Healthy Aging with Disabilities at the Veterans Affairs Medical Center in Houston, Texas. In 2004, he earned his Ph.D in biomedical engineering from the Case Western Reserve University in Cleveland, Ohio. His major research interest is in developing methods for analysis of voluntary motor control after spinal cord injury and in computational neuroscience. Several related manuscripts have been published or are currently in press.

## Paula Russum, RN, CRRN

Paula is a research nurse at the Center for Neuroscience and Neurological Recovery at Methodist Rehabilitation Center. She is a graduate of the University of Southern Mississippi with bachelor's degrees in physical education and nursing. Paula began her nursing career at Duke University Medical Center in 1986. She received her rehabilitation nurse certification in 1989. Before her research career, she worked as a staff nurse, an in-patient nursing supervisor and an outpatient clinic nurse. Paula is the co-investigator on the THANKS grant, a transitional education program for persons with spinal cord injuries. She is also nurse coordinator for several spasticity projects and is actively involved in research related to the Traumatic Brain Injury Model System of Mississippi. Paula is currently pursuing her master's degree in community/public health nursing, anticipating graduation in July 2005. Paula has made several presentations at the annual meetings of the American Association of Spinal Cord Injury Nurses and at the Association of Rehabilitation Nurses.

## RESEARCH STAFF:

**Antonio Hayes, R.EDT./EP.**  
Neurophysiology Technologist

**Barbara Farley**  
Research Assistant

**Cathy Henderson, PT, ATP**  
Research Therapist

## PROJECT SUPPORT:

**Robert J Hirko, PhD**  
Director, Biomedical  
Engineering Department

**Allison Fracchia, PT, ATP**  
Assistive Technology Clinic Coordinator

ADDITIONAL SUPPORT

“The beginning of wisdom is found in doubting; by doubting we come to the question, and by seeking we may come upon the truth.”

—Pierre Abelard

## Lecture Series

### Provides View of Advances in Rehabilitation Research

The latest developments in the areas of stroke, brain and spinal cord injury research take center stage each fall during Methodist Rehabilitation Center's annual Frontiers in Rehabilitation Neuroscience lecture series.

Sponsored in conjunction with the hospital's Center for Neuroscience and Neurological Recovery (CNNR), the series brings renowned researchers to Jackson to share their knowledge on a variety of topics pertinent to the rehabilitation community.

A common goal of the hospital and CNNR is to advance the science in rehabilitation research and promote evidence-based medical practice and care for individuals with neurological disorders.

The first lecture in the fall of 2003 featured National Institutes of Health researcher Dr. Leonardo G. Cohen, who is chief of the Human Cortical Physiology Section of the National Institute of Neurological Disorders and Stroke.

Dr. Cohen reviewed recent research on the brain's ability to recover motor function after central nervous system injury or disease and discussed how those findings may influence future therapies for stroke and brain injury patients.

The second lecture in the fall of 2004 brought Andrew R. Blight, Ph.D., to town to speak on the clinical development of the potassium channel blocker 4-Aminopyridine (4-AP) for the management

of spinal cord injury and multiple sclerosis.

A former director of the Neurosurgery Research Laboratory at the University of North Carolina at Chapel Hill, Dr. Blight now serves as chief scientific officer and executive vice president/ research and development for Acorda Therapeutics, Inc.

Dr. Blight has been studying whether 4-AP is effective for improving neurological function in people who have spinal cord injuries or demyelinating diseases such as multiple sclerosis.

Dr. Blight spoke on the promising nature of the research regarding multiple sclerosis, and the challenges of evaluating the drug's effects on spinal cord injury. ■

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Funded by the Traumatic Brain Injury Model System of Mississippi.

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Funded in part by Medtronic, Inc., Minneapolis, Minnesota.

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## MATHEMATICAL MODEL AIDS IN ASSESSING SPINAL CORD INJURY

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# Join Our Team SCI Medical Director

Methodist Rehabilitation Center in Jackson, Mississippi is seeking a medical director for its Spinal Cord Injury (SCI) Program—a 23 bed unit in the 124-bed hospital. Candidates should be a BC/BE physiatrist or a neurologist with strong academic interests to take part in patient care, teaching and research. BC/BE in SCI medicine is strongly preferred. Candidates should have demonstrated evidence of excellence in administration and leadership. Clinical experience and research related to SCI is mandatory. It is anticipated that the candidate would qualify for an academic rank of clinical assistant professor at the University of Mississippi Medical Center which is physically connected to Methodist.

The majority of SCI patients in Mississippi are admitted to Methodist. Our highly skilled staff of physicians, researchers, nurses and therapists are familiar with contemporary approaches to SCI management. This team works together on a dedicated SCI floor to help patients achieve their highest level of independence. The hospital, which has treated more than 3,000 SCI patients since it opened in 1975, now treats an average of 75 new patients a year.

Methodist's SCI Program is accredited by the Commission for Accreditation of Rehabilitation Facilities and the Joint Commission on the Accreditation of Healthcare Organizations. The hospital is home to the Center for Neuroscience and Neurological Recovery and the Wilson Research Foundation. It is one of only 16 hospitals in the nation designated as a Traumatic Brain Injury Model System by the National Institute on Disability and Rehabilitation Research and one of only two hospitals in the state accepted into the prestigious Council of Teaching Hospitals. Methodist is also the only Mississippi hospital to be named one of America's best by US News and World Report. For more information about Methodist, go to [methodistonline.org](http://methodistonline.org).

Candidates should submit their curriculum vitae, a letter outlining background and experience and three professional references to:

Medical Director Search Committee  
Methodist Rehabilitation Center  
1350 E Woodrow Wilson, Jackson, MS 39216  
601-364-3462

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