

Physical therapist Catherine Yates leads Dr. Vann Craig Natchez through exercises to improve the strength and balance in his lower extremities. The director for the Mississippi State Board of Medical Licensure said he now has a healthier respect for the damage one mosquito can do. And he's warning other caregivers not to take West Nile virus lightly. "I don't think physicians understand how serious this is," he said. "It is not a simple fever-headache, get-over-it kind of disease. This is like polio. The virus can attack motor neuron cells and muscles die. I was doing 50 pound curls in the gym, and now I can barely do 10."



examined first the spinal fluid and then the blood of a broad spectrum of WNV patients—including 35 with neuro-invasive diseases such as meningitis, encephalitis and poliomyelitis and 55 with less severe WNV fever.

"We found over one-third of patients with WNV fever had elevated proteins in their blood similar to biomarkers found in the blood of those with more serious forms of the disease," Dr. Leis said. "And that implies that the proportion of patients with neuro-invasive disease is much higher than has been acknowledged by the CDC."

Dr. Leis said both studies—published in 2010 and 2012 in the journal *Muscle & Nerve*—confirm what many WNV experts suspected.

"Anyone who has dealt with these patients understood even back in

2002 that there was no way that WNV fever was just another summer flu," Dr. Leis said. "These patients have prolonged, disabling fatigue, sleep problems, recurrent headaches and difficulty concentrating and focusing attention, and this goes on for months after this so-called benign illness."

To determine the extent of nervous system damage, Dr. Leis recommends West Nile virus patients with weakness undergo comprehensive electro-diagnostic tests.

"In addition to neurological examination, 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 may have permanent profound weakness, like in cases of polio."

Being able to predict such an

outcome helps decide appropriate therapy, Dr. Stokic said. "For example, a patient likely to remain in a wheelchair or have difficulty walking would need more extensive rehabilitation services than one with short-lived muscle weakness."

**More Mysteries to Unravel**

Methodist Rehab researchers, along with Gabriella Szatmary, MD, PhD of Hattiesburg, also are examining the possible link between WNV and myasthenia gravis (MG), a correlation they recently presented to a New York Academy of Sciences meeting.

Oddly enough, Gibbs was part of that research, too. "It turns out the first patient that Methodist Rehab ever described with WNV poliomyelitis was also the first patient to develop MG several months later," Dr.

Leis said.

A type of auto-immune disorder, MG can weaken the voluntary skeletal muscles and includes symptoms such as double vision, drooping eyelids, fatigue and difficulty chewing, swallowing, talking, climbing stairs, lifting objects or rising from a seated position.

"I don't know what I did to deserve all this," jokes Gibbs, who adds he's grateful for Dr. Leis' expertise. Another of his doctors thought his MG symptoms—slurring speech and trouble swallowing—might be "a mind thing."

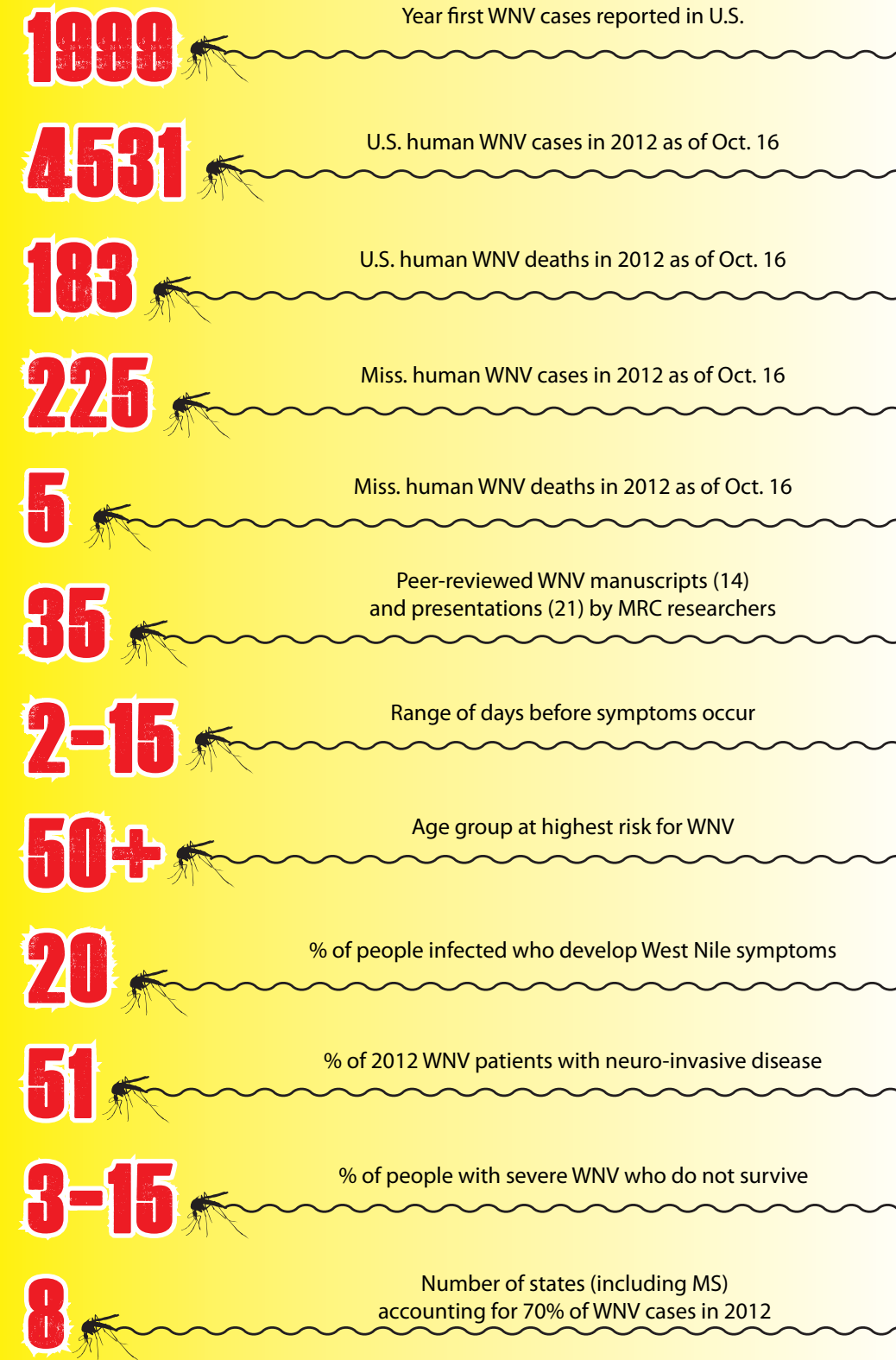
"But she called Dr. Leis and he came over at 4 that afternoon and by 8 that night he said: 'I think you have myasthenia gravis. I just need to do a blood test to confirm it,'" Gibbs said.

At the time, it was thought to be the result of WNV weakening the immune system and another disease taking hold. But by last year, Dr. Leis had found four more patients with the double diagnosis in a WNV support group organized by the state Health Department.

"We realized there was more to it," Dr. Leis said. "We had heard through national meetings that other investigators were seeing this also. Then the sixth case came to our attention because a colleague at Mayo Clinic picked up the phone and called us. He said: 'I've seen the weirdest thing—a patient with acute WNV infection who several months later came down with classic MG.'"

At its worst, MG can impact the muscles involved in breathing, and some patients like Sandra Jordan of

**WEST NILE  
BY THE NUMBERS**



Source: Center for Disease Control

Hattiesburg end up on respirators. "It's a terrifying disease," she said. "I didn't expect to survive."

Whenever she had the strength, Jordan said she would search the Internet to learn what she could about West Nile virus and myasthenia gravis. But it was her husband who ultimately helped her find the right resource when he pushed her to attend a WNV support group meeting.

"Dr. Leis asked who had both West Nile and myasthenia gravis," Jordan said. "And I ran up to Dr. Leis and begged him to use me for whatever research he could do. I don't want anyone to go through what I went through. I want there to be more information."

It's a sentiment shared by Methodist Rehab researchers, who have proposals for more West Nile virus studies in the works.

"One of the prerequisites for expertise is you have to have a passion for the clinical research and the treatment of the condition," Dr. Leis said. "And we've organized a team that has a passion for treating patients with West Nile virus infection."

The goal is to give patients the best chance to recover. And Gibbs, for one, is grateful for the resources at Methodist Rehab.

"Over time I got use of my arms and left leg again," he said. "And in the last year or so, I've even been able to play a little golf."

*A support group for West Nile virus survivors meets quarterly in Jackson and Hattiesburg. Call 601-981-1234 for more information.*

# WEST NILE VIRUS: A CAREGIVER'S PERSPECTIVE

*What's it like to watch a loved one battle a life-threatening disease that baffles even physicians?*

*Freelance writer **Nicole Valaire** of Madison knows firsthand, and agreed to share her memories with Ways & Means readers.*

**T**he speed with which the virus brought down my otherwise healthy husband was staggering. Wednesday morning, July 25, 2012, my 46-year-old husband, Stefan Frischmeier, an aerospace engineer, father of our 5-year-old daughter Sophie and 2-year-old son Leo, was his normal self. Wednesday night, he spiked a fever of 103 degrees. He went to bed that night and did not get up Thursday at all. Not to eat, not to go to the bathroom, he didn't move, and we couldn't medicate his fever away. He also developed a rash on his face and arms.

By Friday night, 48 hours after the fever started, he was in the Baptist Medical Center ICU, heading into a coma, and fighting for his life. It was that fast. Tests later confirmed that he had encephalitis caused by West Nile virus, which he got from a mosquito bite we never saw.

On Sunday, July 29, the worst day of our lives, the Baptist ICU doctor summoned me to the ICU, saying it wasn't impossible to come back from where my husband was, but ... The doctors had done everything they could to save his life, but now it was down to my husband. Thank God he fought back with a vengeance! At first, the doctors didn't know if he would live. Then they didn't know if he would come out of his coma. When he did come out of the coma, he didn't recognize anybody. I asked the doctors if he would ever recognize me again. They didn't know. On day 10 of his ordeal he finally recognized me, a huge relief!

After nearly two weeks in the ICU, he arrived at Methodist Rehab completely bedridden and in such a mental fog, that he pretty much only knew his name. He didn't know the day, the date, his age, he could no



longer tell time, and he went from being an aerospace engineer who worked with complex math, to not being able to add up the change in his pocket. Fortunately, after a month at Methodist Rehab, he has made an astonishing recovery! He is now teaching his speech therapist Lauren geometry, and it will just be a matter of time before he walks again.

The final hurdle for my husband is the fatigue that is the most long-term and debilitating symptom of the virus. We won't know for a number of months whether he will eventually regain enough energy to resume his former life as an aerospace engineer. We still consider ourselves extremely fortunate. I have tested positive for

West Nile virus. I suspect my children and my 70-year-old mother who is visiting us have had it as well. We all developed the same rash as my husband, but none of us got as sick as he did.

There is at least one other confirmed case in the subdivision next to ours, and I suspect two of my neighbors who have gotten seriously ill have also had it. That makes eight of us in a very small area. We are the tip of a very big iceberg.

Everyone reading this article should take all necessary precautions to protect themselves against mosquito bites and avoid ending up in our situation, which could have been even worse.

# A Testament to Perseverance



## KALA HARVEY'S STORY OF SURVIVAL BY SUSAN CHRISTENSEN

**I**ts burgundy cover is battered, and handwritten notes fill the margins of its well-worn pages. Yet Alma Harvey of Sledge has no plans to replace her beloved King James Bible. It gave her comfort as her brain-injured daughter Kala clung to life in a Memphis hospital after being

struck by a car. And now those notes chronicle a transformation few but Alma had the faith to imagine. "Kala began to talk again after me not hearing her voice since 11/24/2008," reads one entry from October, 2009. "Thank you, Jesus!!!" Today, 22-year-old Kala does much more than merely talk. She also tutors kids in her community

and has plans to return to college online—a recovery that seemed impossible when trauma surgeons first calculated the severity of her injuries. "They did a CT scan and MRI and told me they didn't see any brain activity," Alma said. "They said if she did survive, she would have no quality of life." Still, Alma refused to sign a do-

not-resuscitate order or to send the baby of the Harvey family to a nursing home.

“I’ve only believed she was going to get better,” she said. So she insisted Kala be transferred to Methodist Rehabilitation Center’s nationally recognized brain injury program.

“I wanted to see Kala be able to take care of herself, and a lot of people told me I was in denial,” she said. “But I knew Kala needed to come to MRC.

“When we got there,

we found not just doctors, nurses and therapists—we found an extension of our family. They gave us support every way we needed it—whether it was physical, financial or emotional.”

**There’s Always a Chance**

Not that long ago, Kala’s case might have been considered a lost cause.

Conventional wisdom gave brain injury victims a limited window for recovery, typically six months to a year.

“And if you were like Kala—mini-

mally conscious at three months—a lot of people didn’t have much hope,” said Clea Evans, PhD, director of Methodist Rehab’s neuropsychology department.

“Now we are following over 400 brain injury survivors up to 10 years post-injury, and we are seeing the rehab process is much longer. We can see improvements Year 2 to Year 5 post-injury.”

When Kala arrived at Methodist Rehab on Jan. 8, 2009, Alma was told: “There’s always a chance.” But staff didn’t downplay the seriousness of Kala’s injury.

“It was one of the worst brain scans I’ve ever seen,” said Dr. Zoraya Parrilla, a rehabilitation physician for the hospital’s brain injury program. “She had different types of bleeds affecting different parts of the brain and multiple injuries.”

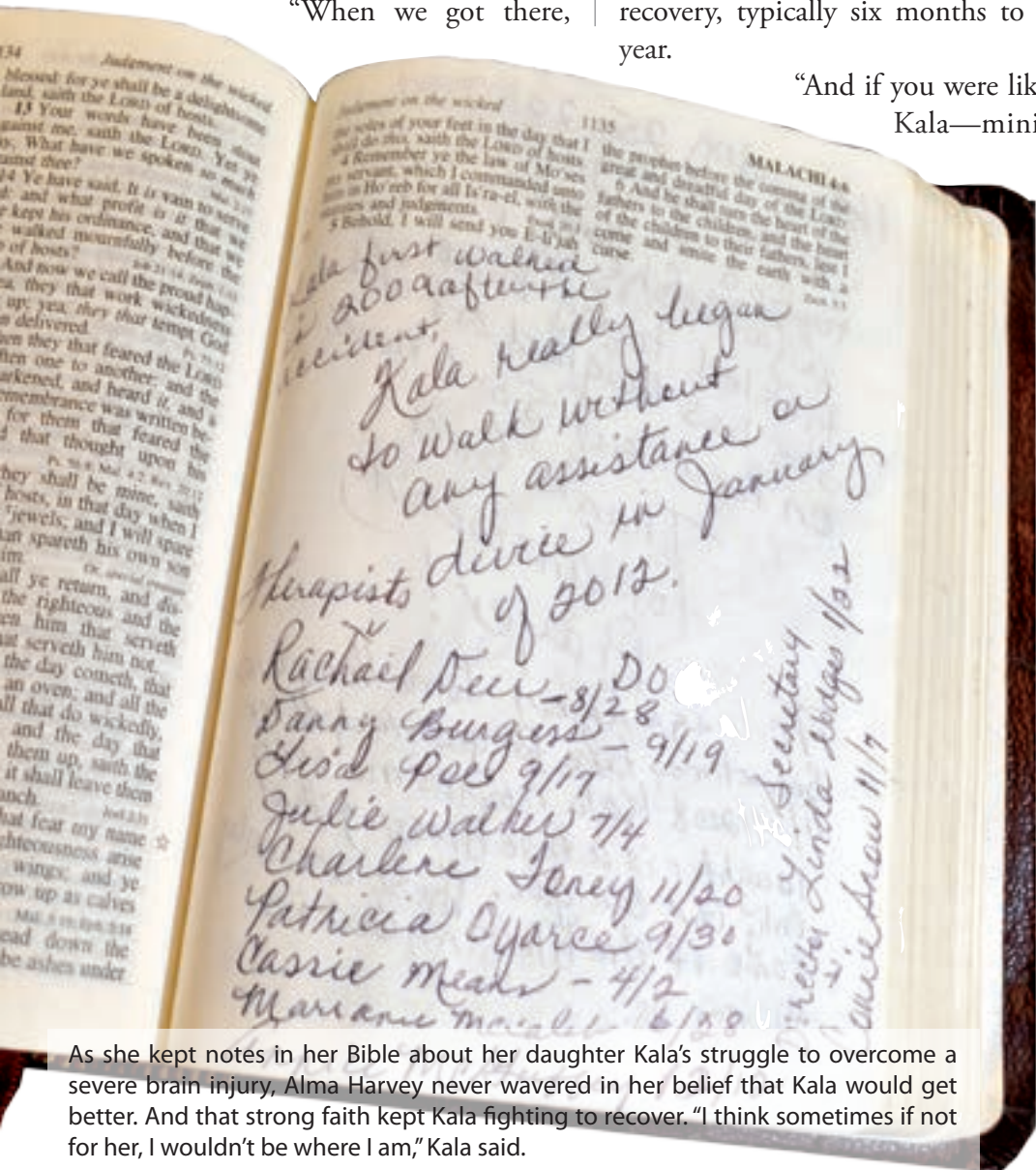
Still, Kala’s inability to talk, sit up, walk or even swallow was not a new challenge for Methodist Rehab’s seasoned brain injury team.

The medical staff and researchers have extensive experience treating the most complex rehab cases, including being part of a recent national study that proved the drug Amantadine can speed the recovery of people with severe brain injuries.

To rouse Kala from her minimally conscious state, Methodist Rehab staff turned to a customized drug regimen and intense therapy sessions.

“You could tell she was trying so hard ... you sensed something was in there,” said speech therapist Holly Radicioni. “It was just a matter of getting to her.”

In the library of Madison Palmer High School in Marks—where she was once valedictorian—Kala Harvey tutors Kevona Ratliff, at left, and her sister, Icis. “She likes to crack jokes, but when it’s time to get serious, she gets serious,” Kevona said. “My math has improved a whole lot.”



As she kept notes in her Bible about her daughter Kala’s struggle to overcome a severe brain injury, Alma Harvey never wavered in her belief that Kala would get better. And that strong faith kept Kala fighting to recover. “I think sometimes if not for her, I wouldn’t be where I am,” Kala said.

To spark a reaction, Radicioni started Kala on a sensory stimulation program. “I had her mother bring CDs she made her senior year of old Aretha Franklin and hip-hop songs,” Radicioni said. “And I used smells a lot with her—coffee grounds, seasonings, dill pickle—not very pleasant ones to see how she would react.”

Two activities captured Kala’s attention—visits with Puma, Methodist Rehab’s therapy dog, and kicking a big red ball.

“The biggest thing that helped her was encouragement from the

therapists,” Alma said. “They let her know what she did was special.”

**Whatever It Takes**

Once Kala exhausted her inpatient potential, she moved back home, where her mother pushed hard to provoke a response.

“It broke my heart, but I would make her mad,” Alma said. “I would say: ‘I’ve got to feed you through a tube, but you’ve got a mouth. You’ve got a brain.’ One day she was so mad, I saw her muscles trying to move.”

A series of firsts followed—swal-

lows, steps and then came the day she croaked out, “Mom.”

“I thought I was dreaming,” Alma said. “I said: ‘Kala, did you call me?’ She said: ‘Yes.’ And I said: ‘Say it again.’ It was like having a little one again saying her first word. It was the best thing I’ve ever heard.”

Kala’s awakening meant she was ready for more inpatient rehab, and Dr. Parrilla was aggressive with her treatment.

“Some people might say: This is what you have, deal with it,” Dr. Parrilla said. “But we took her dur-

ing her different recovery stages and averted a chronic disability.”

By the time Kala finished at Methodist Rehab, she had been in the hospital twice and undergone therapy at Methodist Outpatient Neurological Rehabilitation and Quest, a community reintegration program that helps brain injury survivors return to school, work or community life.

“She utilized a lot of our interventions,” said K.K. Ramsey, a nurse practitioner who still sees Kala through Methodist Rehab’s outpatient brain injury clinic and spasticity management program. “When-

ever I would suggest something, her mother would say: ‘Whatever it takes.’”

Kala, too, was willing, volunteering for everything from Botox injections to address crippling muscle stiffness to wearing neuro-stimulation devices to activate weakened nerves and muscles in her left leg.

She even let Methodist Rehab researchers test her walking ability in the hospital’s Motion Analysis and Human Performance Lab, the only one in Mississippi and one of but a few in the Southeast.

“I’m ready to try some more. They can use me as a test dummy,”

she jokes.

The quip is classic Kala, say her therapists, who marvel at her sass and optimism after almost four years in therapy.

“I’ve been amazed by her emotional resilience,” Evans said. “She has never had any depression, and she has never been bitter.”

Kala says she even forgave the motorist who very nearly killed her.

**A Miracle in the Making**

Kala’s accident happened at a time when the 18-year-old had the world on a string. She was a scholarship student at Northwest Community



Kala Harvey paints a picture in her bedroom in Sledge, one of many activities designed to improve her fine motor skills.

Above and right, Kala Harvey wore oversized sunglasses to her Quest graduation, which got a laugh from staff gathered to give her a fond farewell. Front row from left are, Puma the therapy dog, Rachel Dear, Patricia Oyarce, Kala Harvey and Charlene Toney. Back row, from left, are Jenn Sivak, Lisa Poe, Danny Burgess, Julie Walker, Marianne McCaleb, Cassie Means and Connie Westbrook.



To watch a video from Kala’s Quest graduation, go to [youtube.com/methodistrehabms](https://youtube.com/methodistrehabms)

College and was home to celebrate her brother Jerry's 27<sup>th</sup> birthday.

Around 6 p.m., she joined her sister Candace and family friend Craig Jefferson for a walk alongside a straight stretch of Main Street in Sledge. Alma said the group was facing traffic and didn't see a car coming at them from behind until it was too late.

Candace tried to pull her sister to safety, but Kala was hit by the car and thrown onto the windshield. Today, she only remembers "the screams."

"It carried her past four or five light poles before the driver got on the brakes and it chunked her off the car," Jefferson said. "The only thing I could think of was: I've got to get Mrs. Harvey. I ran through ditches."

Jefferson drove Alma to the accident scene, where she found Kala

crumpled on the street, her head so swollen she was unrecognizable. "The hardest thing was watching her laying there until an ambulance came," Alma said. "Everyone thought she was dead at the scene."

So it's no wonder that hometown folks now consider Kala a miracle in the making.

"One lady walked up to Kala and said: 'Just rub my back because I know you've been blessed,'" Alma said. "She's touched so many people who don't even know her. And through it all, the Lord has given Kala her personality back. She has always been a caring person, and she still is."

Along with her compassion comes a streak of stubbornness that has kept Kala pushing to get back on her feet.

"When I couldn't walk, that frustrated me the most," Kala said. "People were looking at my wheelchair, instead of me."

At Quest, physical therapist Rachel Dear worked hard to help Kala reach her goal to walk without assistance. "I talked to K.K. once a week just trying to problem-solve why Kala's left knee wouldn't bend," Dear said.

Initially, staff thought Kala's knee issues were caused by spasticity, an extreme muscle stiffness that Methodist Rehab often treats through Botox injections or an implantable medication pump filled with anti-spasmodic drugs. But motion lab results indicated spasticity wasn't the problem, and Kala was referred to a surgeon who removed scar tissue from her knee.



After Kala Harvey was hit by a car as she walked facing traffic along this straight stretch of Main Street in Sledge, a sign (see opposite page) was put up to warn motorists to slow down.



"WHEN WE GOT TO METHODIST REHAB, WE FOUND NOT JUST DOCTORS, NURSES AND THERAPISTS—WE FOUND AN EXTENSION OF OUR FAMILY. THEY GAVE US SUPPORT EVERY WAY WE NEEDED IT—WHETHER IT WAS PHYSICAL, FINANCIAL OR EMOTIONAL."

— *Alma Harvey*

Today, she walks by herself—albeit slowly. And she dreams of running again. Mostly, she wants to return to the promising life she left behind before her injury.

Kala said she made it through by asking God for strength and relying on her mother's unwavering support. "I think sometimes if not for her, I wouldn't be where I am," Kala said.

Kala and her mom also give credit to Methodist Rehab staff, who were willing to work as hard as the Harveys to sustain Kala's recovery.

"Wherever we were, they met us," Alma said.

At Kala's Feb. 16 graduation from Quest, a crowd of caregivers arrived to wish her well. In fact, so many came, the festivities had to be moved to a bigger room.

Kala showed up for the party wearing giant orange sunglasses—a nod, perhaps, to the bright future she has planned. She wants to pursue a career as a kindergarten teacher. And Dear, for one, believes she has the determination to reach her goals. It's why she suggested the inscription "Congratulations to the Total Package" for Kala's graduation cake.

"In my years of working with patients with traumatic brain injury, I

realized the ones who fare best possess three different things," Dear explained. "They have the motivation to work hard (because we can be slave drivers), a positive attitude to roll with the punches (because recovery doesn't come fast) and a support system (family friends and medical team) that will encourage them every step of the way.

"I decided Kala had all three and that made her the total package. I've never seen a patient more motivated."

*For more information on Methodist Rehab's brain injury program, call 601-364-3336.*



At her graduation party at Quest, Kala Harvey caught up with old pal Puma the therapy dog and enjoyed some homemade ice cream cake as her mom, Alma Harvey, and occupational therapist Jenn Sivak looked on.

# A Testament to Technology

METHODIST REHAB'S IN-DEPTH, SPECIALIZED SERVICES WERE ONE KEY TO KALA HARVEY'S CONTINUED RECOVERY. HERE'S A LOOK AT SOME OF THE INTERVENTIONS THAT HELPED HER MAKE PROGRESS OVER A MORE THAN THREE-YEAR PERIOD.

## Body Weight-Supported Treadmill Training

Even before they can take steps on their own, Methodist Rehab patients are able to practice walking via a specialized treadmill that supports a portion of their weight via a harness, pulley and pneumatic system. The set-up allows therapists to introduce a stepping motion early on, which helps retrain the patient's central nervous system and encourage the ability to walk.

## Spasticity Management

Methodist Rehab's significant research on spasticity makes the hospital's spasticity management program a sought-after resource for those who suffer from the crippling muscle stiffness. The program provides outpatient therapies such as Botox injections and the monitoring of implanted medication pumps.

## Bioness L300 Plus

This neuro-stimulation device helps activate weakened nerves that control muscles in the upper and lower leg. Specially trained physical therapists custom-fit and program the wearable device to help patients overcome problems such as foot drop and knee instability.

## Interactive Metronome (IM) Training

Patients who use this innovative treatment don wireless headphones and perform various therapeutic exercises to the sound of a measured beat. The treatment can help improve attention, concentration, motor planning and sequencing skills. IM training uses neuro-sensory and neuro-motor exercises to develop and improve the brain's inherent ability to repair or remodel itself through a process called neuro-plasticity.

## Motion Analysis and Human Performance Lab

Equipped with an eight-digital camera motion analysis system, two



Kala Harvey wears a Bioness L300 Plus neuro-stimulation device on her left leg as she exercises on a treadmill in Quest's therapy gym. Physical therapist Rachel Dear, at left, says the device helps patients overcome problems such as foot drop and knee instability.

video cameras, five force plates in the floor, an electronic walkway and other high-tech features, this lab allows Methodist Rehab scientists to objectively measure a patient's motor performance, pinpoint problems and evaluate the effectiveness of various treatments.



# Graduation Day

One spinal cord injury patient's incredible road to recovery

**M**endenhall High School senior Michael Shelby, like others in the graduating class of 2012, walked across the school's football field to receive his diploma on the night of May 14.

Granted, high school graduation is a joyous occasion—a remarkable milestone, a life-changing event to be remembered. But for Shelby, it was much more than that.

What made Shelby's graduation exceptional is a simple act many take for granted. He did what just a little over a year ago he was told he might never do again—he walked.

**“Going to Walk Out of There”**

On Feb. 9, 2011, in Biloxi, Shelby fell during a tumbling routine and broke his neck.

After being admitted to the University of South Alabama Medical Center, his initial prognosis was not promising.

“I was told after I got out of sur-

gery that I would never, ever walk again—I would never move again, probably,” Shelby said.

It appeared that he had sustained a C5-C6 incomplete spinal cord injury, cervical level damage, which often results in complete paralysis below the neck.

All signs pointed to the possibility that Shelby might have to come to terms with spending the rest of his life in a wheelchair.

He then came to Methodist Rehabilitation Center, a hospital that is by all means equipped to prepare him for such a life.

But Methodist Rehab offers much more—a full range of therapies and rehab technology and an expert staff that come together to allow every patient to achieve their fullest potential.

And Shelby came convinced his potential was greater than what he had been told. He insisted that he would “prove everybody wrong.”

“I said I'm going to do something

you've never seen before,” he said. “I told them I was going to walk out of there.”

**A Methodist Rehab “Graduate”**

Graduation is often a symbolic rite of passage, representative of the culmination of hard work, perseverance and self-discovery, of goals met and oftentimes exceeded.

It is fitting then that those who are discharged from Methodist Rehab are often referred to as “graduates.”

For Shelby, that day came on March 17, 2011, a little over a month after he first checked in. And it was a day that Shelby made good on his earlier promise.

“Sure enough, the day I got discharged—it was hard and my walking wasn't good—but I got to walk out of there,” Shelby said.

To fast-forward from Shelby's accident and being told he might never walk again to his walking with the assistance of a walker out the doors

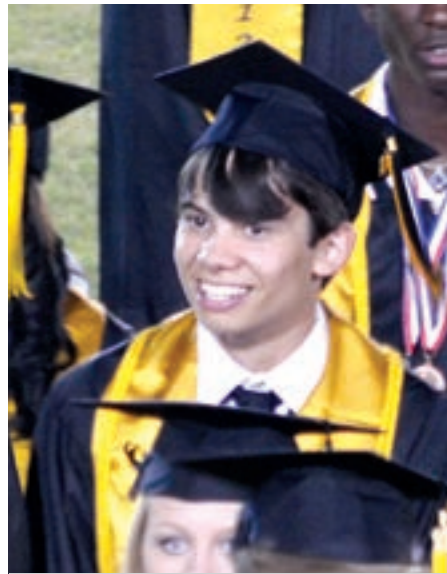
By Carey Miller



of Methodist Rehab a little over a month later makes his story seem all the more incredible, miraculous even.

But to gloss over that month of his life is like ignoring the exams taken, papers written and long hours of studying on a student's path to graduation. That month is the heart of Michael's story.

It's an equally incredible tale of hard work, perseverance and self-discovery, of goals met and often-times exceeded, not just by Shelby but also his dedicated caregivers at Methodist Rehab.



Michael Shelby at his graduation.

**"The Unconventional Way"**

"At first, he wasn't moving anything at all, maybe a little bit in his right leg," said Ann Howard, who served as his physical therapist during his stay at Methodist Rehab.

Determined as Shelby was to walk again, it did not appear fulfilling his bold promise was even possible. But the patient was eager to do whatever his caregivers asked of him.

"He did have the days where he was upset, and not wanting to come to therapy, but overall he was willing to do whatever he could," Howard said.

Shelby's therapists might have focused on preparing him for life in a wheelchair, had he not agreed to participate in a research study conducted by Methodist Rehab's Research Department, which is headed by Dr. Dobrivoje Stokic.

"In the conventional way, his results weren't looking promising, but once we had done it in an unconventional way, it turned out he was

somebody very much like patients who recover," Stokic said.

That "unconventional way" was "a study in which the objective was to find out other ways of predicting who is going to recover walking, and to what extent," Stokic said. "With the information from our research, Michael looked like somebody who had a whole lot more potential than what he initially presented."

In other words, Shelby possessed the potential for exceptional recovery, but had he not come to Methodist Rehab where they have the tools and expertise to recognize that potential—in this case, Dr. Stokic's research—his recovery would not have been nearly as speedy.

"Let's not kid ourselves," Stokic said. "Michael would have walked either way, he would have walked maybe six months or more later, but by now he would definitely be ambulatory and walking. Most likely, Methodist Rehab accelerated his re-

covery.

"The whole story is that Methodist Rehab allows people to realize their full potential because of the scope of services that are integrated into patient care."

Now that the median length of inpatient rehab is about a third of what it was 30 years ago, it's all the more crucial for early assessment to optimize that window of time.

"If you have five weeks of time, then you have to prioritize," Stokic said. "Are you going to focus your efforts on learning how to improve transfer and wheelchair driving skills, or does it make more sense to put him through some exercises that are geared specifically to recovery of walking?"

Once his potential had been recognized, Shelby's therapy then became focused on walking.

"We were really focusing on trying to get more back because we knew he had the connections remaining in the spinal cord," Howard said. "A lot of times we just have to work with what they have or use compensatory techniques rather than try to get motor recovery."

"Timing is critical because the extent of recovery depends on time," Stokic said. "The faster you start improving, the further you go."

**A Perfect Storm**

Therapy at Methodist Rehab is guided in part by the patient's abilities. Therapists like Howard focus the patient on strengthening what they have.

"We have a broad range of therapeutic options that patients are fitted



Michael Shelby, pictured here with spinal cord injury physical therapist Ann Howard, greatly benefited from using the weight-supporting treadmill system both during his stay at Methodist Rehab and after discharge.

into depending on their capacity," Stokic said.

With Shelby, that capacity was something that literally changed day to day.

"I think what was neat about his progress here was that each day he regained ability to move a new muscle, and we were able to use a new piece of equipment that we have, or a new treatment technique," Howard said.

Since Shelby was only able to move his right leg, Howard put him to work on the functional electrical stimulation (FES) bike first.

"When he first got here, we used the bike to stimulate the muscles on

both legs, but then his right leg got so much stronger that we just focused on the left leg," Howard said.

As its high tech-sounding name suggests, the FES bike isn't just your garden-variety exercise bike.

Howard explains: "The bike stimulates the muscles at the right time they're supposed to be used. It's connected to a computer, and you set it for the patient's specific diagnosis. You can control the speed and how much stimulation they're getting—the more a patient can pedal the bike by themselves, the less stimulation they need."

Another device that aided greatly

in Shelby's therapy was the standing frame, which allows patients who may not be able to stand on their own to maintain a standing position. Howard says this device is beneficial because it puts weight on the patient's bones, stimulates their muscles, helps stretch out their legs, and aids in bowel, bladder and respiratory functions.

"In therapy, in between breaks from working on his legs, we didn't just sit there," Howard said. "We worked on his trunk control in-between. That way he was getting the most out of therapy as possible. Being so young, he didn't require as

much rest as some patients do.”

But Howard, Stokic and Shelby all agree that the weight-supporting treadmill system helped his recovery the most.

“A system like the treadmill allows patients and their therapists to utilize their time more efficiently,” Stokic said. “They get more activity in the spinal cord by making many more steps than they can do over ground. It’s more efficient, safer and easier for patients.”

The weight-supporting treadmill system is a therapy that has helped many patients make significant gains in their walking ability. While the treadmill’s harness, pulleys and pneumatic system support the patient’s weight, therapists can assist the person with a stepping motion.

“I did that even after I finished outpatient,” Shelby said. “I will still come do the treadmill at least twice a week. That’s what really got me started. After I got on that treadmill, things started coming back real quick. The treadmill was one thing that I saw helped the best.”

In many ways, Shelby’s story is a perfect storm of rehab success. Research’s expert assessment of Shelby’s potential allowed him to be paired with the proper therapies and technologies, which, coupled with the dedication and guidance of his therapists as well as his own determination, aligned to make his recovery one of the most dramatic some hospital staff had ever seen.

“I think he made a tremendously speedy recovery that I haven’t seen, maybe even in my lifetime, considering the state he came in and how far



Michael Shelby with his physical therapist and mentor Ann Howard.

he went,” said Stokic, who has been at Methodist Rehab since 1997.

Howard, on the other hand, was only on Methodist Rehab’s staff for a few months before she worked with Shelby.

“I didn’t realize until later just how exceptional he really was,” she said, laughing.

**“He Lights Up the Room”**

If you were to meet Shelby today, you might be convinced this story were about someone else. You cannot tell he had suffered such a trauma by looking at him. He walks naturally and seemingly effortlessly, with the youthful confidence many young men of his age exude.

“I think he still does have some sensory deficits—like not being able to feel everything—but you could

never tell that by the way he’s able to walk and move around,” Howard said.

Speak to him and he’ll be glad to share his incredible story, colored by his infectiously sunny disposition and boundless optimism that some might even call swagger.

“He’s not shy at all,” Howard said. “He lights up the room.”

Shelby’s experiences at Methodist Rehab, much like a student’s educational odyssey, have led him toward much self-discovery.

“Being here, and having to go through what I went through, it was just a really good experience,” he said. “In some ways I wish it wouldn’t have happened but I’m glad it did because it made me better, it got me closer with God. It got me closer with my parents.”

It’s also led him to answer that question many graduates struggle with: What do I want to do with my life?

For him, the answer is to pursue a career in physical therapy.

His first step down this path was choosing to do his senior project on the profession.

“When I found out I had to do a senior project, I knew I wanted to do it on physical therapy,” Shelby said. “And I knew it had to be with Methodist, because I had a great experience there. I know a lot of the people, I know how they work, and it’s a great facility.”

Shelby then asked Howard to serve as his mentor for the project.

“I was very honored that he asked me,” she said. “It was very neat for him to want to give back to what

had helped him so much.”

And for the fund-raising portion of his senior project, Shelby chose the Walk & Roll, Methodist Rehab’s annual fund-raising event for the Wilson Research Foundation, which was held on March 31, 2012.

“I was talking to Ann about needing a tangible product for my project to raise money,” Shelby said. “She told me about the Walk & Roll. I thought that would be a lot cooler, to be able to participate and help out.”

Shelby walked in the event and helped raise funds for the foundation. Now, he is in his first semester at Copiah-Lincoln Community College. After that, he hopes to go to four-year college, and eventually set-

tle into a career in physical therapy.

“Maybe I can get a job at Methodist,” Shelby said.

Howard believes Shelby’s unique perspective would allow him to excel in the profession.

“He can not only sympathize with the patients, like we do, but he can also empathize,” she said. “Because he’s been there. He knows the good, bad and ugly of what it’s like in therapy.”

In fact, she already got a glimpse of Shelby’s potential when he came back to Methodist Rehab to work on his senior project.

“I had a patient that was 13 years old at the time and Michael came up here and was very encouraging and motivational to that patient ... my

patient at the time just completely changed his whole attitude after seeing the progress that Michael had made,” she said.

Stokic agrees that Shelby could have a bright future in the profession, adding that sometimes compassion can be more critical in the early stages of rehab than any skill learned in school.

“It’s inspirational for us as well, when you see someone like Michael who decides to go back and pursue a physical therapy career, and we were the people to sway him in that direction,” Stokic said. “It inspires us to continue to do what we do.”

*For more information on Methodist Rehab’s spinal cord injury program, call 601-364-3498.*



Michael Shelby participated in the Walk & Roll, an event to raise funds for the Wilson Research Foundation that is held in the spring.

# BACK TO OUR BEST



**M**ethodist Rehabilitation Center is constantly improving its facilities in order to provide the highest level of care available in the area.

A major renovation that took place in 2012 is a complete renovation of the main hospital's fifth floor, which houses Methodist Rehab's brain injury program (see opposite page).

The center is also in the process of significant improvements to its Outpatient Rehabilitation Center in Flowood. Already completed are the new offices of the Seating and Wheeled Mobility Clinic, which was formerly known as the Assistive Technology Clinic and was housed on the main campus (see right).

Currently in progress is a complete renovation of the outpatient therapy center's therapy gym, which will be completed in late October 2012, as well as updating the main campus' elevator system.

# WHERE are they now

A look at what some Methodist Rehab alumni have done since they left the therapy gym

Almost 10 years after suffering a spinal cord injury when he fell from a deer stand, **Eddie Ray** is walking without a cane and staying busy. He works full-time at First Natchez Radio Group, where he is occasionally on the air and also assists with the production of commercials and football game coverage for three high schools, Ole Miss and the New Orleans Saints. He also goes camping and serves as crew chief for two hot air balloons during the October balloon races in Natchez.

For the last five years, he also has served as the Fire Chief for Foster Mound Volunteer Fire Department in Adams County and is a six-year member of the Adams County Search and Rescue Team.

Ray well remembers his therapists and physician emphasizing the need to be independent, and he is grateful to have come so far. "I could not have done any of this without the strength of my family, friends and God," he says. "Looking back I would say the most important thing

to remember is not to complain because there is always someone whose situation is worse than yours."

Burned over 90 percent of his body in a gas well explosion in 2006, **Billy Jack McDaniel** never gave up as he underwent therapy at Methodist Rehab. And his determination motivated others to give it their all. Now living in the North Carolina mountains with wife, A'leta, and daughter, Carney, McDaniel continues to inspire by sharing his story with churches and other groups. He and A'leta also recently published the memoir *Dead Man Breathing*, "the true story of a living miracle." To learn more, go to [www.billyjackmcdaniel.com](http://www.billyjackmcdaniel.com).

Almost two years after a car accident on the way to work, **Jessica Ferrin DeBusk** is working two jobs, tutoring elementary students and going to school full-time. It's a far cry from what seemed possible after she broke her lower

back and fractured her neck. "I was told I would be in a wheelchair for up to three years," she said. But DeBusk says five weeks of hard work at Methodist Rehab and the support of family and friends helped her leave the wheelchair behind in just three months. "I am still working on building strength and endurance, but I am walking around just fine without any assistance," she said. DeBusk was living near Ocean Springs at the time of her accident, but has since moved home to Hampton, Virginia. "My life is almost back to normal," she said. "I believe everything happens for a reason, and I believe my injuries turned me into a stronger person than I was before. Since the accident, I have become closer with God and have accepted him as my personal savior by getting baptized. I have not let my injuries get the best of me."

**Jay Levy**, who rehabbed at Methodist Rehab after being paralyzed in a 2009 auto accident



Above: Wiley Clark in 1996 in his Paralympic attire. Right: Clark today during a recent visit to Methodist Rehab.



is an English teacher at Pisgah High School. In his first year of teaching, he led students to the state's highest score on the English II SATP exam with a 98.1 percent passage rate.

**Ashley Moberley** was riding horseback in a clinic in Louisiana when she was bucked from her horse and suffered a spinal cord injury. In the year since, she has worked hard in therapy and is beginning to move around with a walker. She's back at work as a Farm Bureau insurance agent in Tallulah, La., and looking forward to participating in the Horses Giving Hope group ride. "I'm blessed with showing continued

progress and capabilities," she said.

**Wiley Clark** of Pascagoula is a former Methodist Rehab employee who represented Team USA at the 1996 Paralympic Games in Atlanta and the 2000 games in Sydney, competing in the 800-meter, 5000-meter and marathon wheelchair racing events. He also made the 1992 team, but was unfortunately hit by a truck crossing the street at the Olympic Village in Barcelona and was unable to compete.

Clark became quadriplegic in 1980 at the age of 23 in a head-on collision with a drunk driver. He

was inspired to take up the sport by meeting Canadian wheelchair racer Rick Hansen during the athlete's 1988 "Man in Motion" tour that took him around the world.

After the 2000 games, Clark retired from racing, and today he is a career counselor at Mississippi Gulf Coast Community College, where his athletic legacy serves to remind students that anything is possible through hard work and dedication.

*If you would like to catch us up on your life, send an email to [schristens@mmrc rehab.org](mailto:schristens@mmrc rehab.org) or call Susan Christensen at 601-364-3334.*

# All About Acupuncture

A Q&A with Dr. Carmela Osborne

By Carey Miller

*Methodist Pain & Spine Center at the Flowood campus of Methodist Rehabilitation Center offers acupuncture therapy as part of its wide array of pain management techniques. Dr. Carmela Osborne, a board-certified physical medicine and rehabilitation physician, administers the program. She recently spoke to Ways & Means about acupuncture's application in a comprehensive approach to pain management.*

**What is acupuncture?**

Acupuncture is a treatment that involves using very, very fine needles to treat certain points to stimulate the flow of “qi,” which is energy in the body, to promote healing.

**What are its origins?**

It originated in China over 2,000 years ago and is used for treatment of multiple conditions.

**How is it utilized in pain management?**

We're using it to treat painful conditions of the back and neck, such as muscle spasms and radicular symptoms, and chronic pain.

**What does a typical procedure entail?**

First, we do an initial evaluation, including history and a physical exam.

Then we decide on a treatment course to be performed over a series of visits. During the acupuncture therapy, patients are placed in a comfortable position. The skin is cleaned with alcohol, and then the needles are placed. The patient is placed in a comfortable position for about 30 minutes. We actually dim the lights and turn on soothing sounds, like a waterfall or rain. Sometimes we also use electrical stimulation of the needles in certain places to facilitate the treatment. After 30 minutes, the needles are removed and the patient is free to go.

**Most people would want to know: Does it hurt? Is it safe?**

When we use the needles in the ear, you may feel a little prick when they're placed, because that's a very sensitive area, but it doesn't hurt after the needle is in place. When the needles are placed in the body, they aren't felt very much going in. And then when the needle has gotten into the acupuncture point, they may feel a warm sensation—some difference that lets us know we're in the right place. That sensation quickly goes away. There are very few risks with acupuncture—the only real, but minimal risk is a possibility of infection. The patient's skin is cleaned with alcohol prior to the procedure.

**Are acupuncture needles quite different from the ones typically used by doctors?**

Yes, they're actually very fine wires. They have a handle on the end, a little thicker part, for the doctor to use to manipulate the needle.

**Why do you think that in recent years acupuncture has become more widely accepted as a complement to traditional Western medicine?**

I think that's because patients have explored more of what we consider “alternative” choices to medications and surgeries, and it has been more widely developed in this country than it had been previously. Over the course of the last 20 years, there's been much more exposure and availability for acupuncture in the U.S.

**How does acupuncture fit in with Methodist Pain & Spine's existing services?**

We use it as a complementary approach rather than an “instead of” approach. Many patients benefit from physical therapy, from injections, from a multitude of the things that we offer. We offer this in addition to those treatments. It works very well for patients who might not be tolerant of certain medications,



or have not responded to other treatments.

**How do your patients respond to this treatment?**

We've had some great success stories, and we've had patients that have had dramatic improvement regarding their pain.

**What are those success stories? What results have you witnessed firsthand?**

My very first acupuncture patient was a gentleman who had previous back surgery. He had chronic back pain since the 1970s, that he rated at an eight on a one to 10 scale. He's

had a series of acupuncture treatments, and he currently rates his pain as a zero to a one. He walks without a cane, and he's gone from taking three to four pain pills a day to one on occasion.

**You're one of a select group of physicians approved to perform acupuncture by the Mississippi State Board of Medical Licensure. In what ways does that expertise benefit your patients?**

I've had extensive training in acupuncture from a very well-respected course in California. The benefit of having an M.D. perform acupuncture

is that I also know their other medical problems and conditions, and how my treatment can interconnect with their other treatments.

**What types of ailments do you treat at the Pain and Spine Center?**

Our goal is to treat patients that have conditions that we would treat normally in our practice, therefore I will be concentrating on neck and lower back pain.

*For more information on acupuncture therapy or other treatments available at Methodist Pain & Spine Center, call 601-936-8801.*

# Research-Based Care

## A Q&A with Chris Blount, Wilson Research Foundation Director

### What is the Wilson Research Foundation and how does it connect to Methodist Rehab?

The foundation is a supporting organization of Methodist Rehab and it exists to meet needs at the center. Yet it is a distinct entity, a 501(c)(3) nonprofit public charity, with its own board of governors. The name of the foundation honors the late Earl R. Wilson, founding chairman of Methodist Rehab Center, and his wife, Martha Lyles Wilson.

### To date, what has the foundation accomplished?

The Wilson Research Foundation is the primary support for the thriving research program and researchers at Methodist Rehab, providing more than \$4 million in grants. More than half of this investment has occurred in the past five years and has resulted in a number of major published studies and presentations made around the world, while driving innovation and excellence in clinical care delivered by our doctors, nurses, and therapists.

### What is the most gratifying aspect of your work?

It's hard to pick just one thing, and I try to remember daily to thank God for allowing me to be a small part of this mission. Several blessings come to mind: Employees and volunteers here give of themselves in

a way that is hard to describe in words. To them, this work is a calling, not a job. Another blessing is the patients. When a patient recovers the ability to walk or use their hands, despite being told in another hospital that this was impossible, it's an

incredible blessing to see them overcome such a 'larger than life' obstacle. Perhaps the biggest blessing of all is when our research plays a role in the patient achieving a better outcome. I cannot tell you how motivating and humbling that can be.

### Is the goal of research just to publish?

In my view as the foundation director, our researchers have two main functions that are very closely connected: (1) Drive excellence and innovation in the center's clinical programs so that our patients recover ability to the greatest possible extent and (2) Publish and present findings. When Methodist Rehab research is published in medical journals and textbooks or presented at major conferences, we make a global impact, but it's a local



impact as well. By publishing and presenting, our researchers develop collaborations with other centers, and they bring best practices back to Jackson and this hospital. And because of their expertise, the research team here is routinely utilized by physi-

cians and therapists when confronted with the challenge of deciding upon the proper diagnosis and most appropriate treatment. Our research team is the bridge to what works best, in whom and why. Publishing their studies is certainly recognition of research accomplishments, but adoption of knowledge into clinical practice is of the greatest importance.

### Is rehabilitation research really needed today?

The answer is an emphatic yes. Very few government or industry-sponsored research dollars are allocated to rehabilitation compared to other areas of medicine. Yet stroke, brain injury, spinal cord injury and loss of limb have lifelong consequences and place a huge economic burden on families and the nation.

For example, Mississippi leads the nation in the number of people living with stroke per capita (4.3 percent\*). And our rate of traumatic injuries is much higher than the national average. It is critically important that Methodist Rehab and other leading research centers engage in clinical studies to find better ways to recover abilities and quality of life for these patients. \*Source: Centers for Disease Control.

### Why does the foundation focus on research and education?

This was always the founders' vision, that Methodist Rehab would have a support foundation that would fund exceptional programs that are transformational and that establish Methodist Rehab as one of the leading rehab centers in the world. Research and its translation into clinical practice is how we have been able to make the leap from being a very good hospital, to a distinctive and unique center of excellence.

### What are the foundation's goals?

The foundation needs to raise another \$3 million near term to take this research program to the next level. We have had success and laid a lot of groundwork, but there is so much more we need to do. Meeting this fundraising target will allow the foundation to:

- Sustain and expand this thriving clinical research program
- Support current, talented researchers

- Recruit new researchers
- Purchase new state-of-the-art equipment
- Expand our global impact through presentation of research findings in publications and major conferences
- Expand awareness of research work in Jackson, including educational conferences and our visiting scientist program
- Expand neuroscience collaborations

### How will you accomplish this?

Communication is key, getting the word out to all past patients and family members who have been helped by the rehab center, seeking entry level gifts and major gifts. We have a number of approaches. To introduce donors to the foundation, we have our annual Walk & Roll in the spring and a direct mail program. We offer a Spirit of Methodist Rehab program that allows a patient to honor an exceptional caregiver at the center. And for major gifts, our board of governors has dedicated, named fund opportunities that sponsor a researcher position or line of research emphasis. As director, my daily mantra is to get the word out about what we are doing and our vision—what we will accomplish—as we grow. I am convinced we will continue to build this foundation because this mission is wonderfully compelling and unique, and because we are changing and saving lives.

*For more information on the Wilson Research Foundation, call 601-364-3598 or visit [www.wilsonfoundation.org](http://www.wilsonfoundation.org).*



Interested in buying a wonderful Christmas gift—and supporting the Wilson Research Foundation?

Then add "Sweetness Follows—the story of Sam and the Treat of the Week" to your shopping list.

The dessert cookbook is the creation of Katy Houston of Jackson, a close family friend of former Methodist Rehab brain injury patient Samuel Lane Jr.

Each Monday for over a year, Houston prepared and delivered a 'treat of the week' to Lane. And the story of his remarkable recovery is woven throughout an amazing collection of dessert recipes.

"Every week I took Sam a different dessert," Houston says in the book's preface. "Standing on his doorstep every Monday morning was my unspoken way of saying, 'I am with you in this and I care about you.'"

The book is available in the Methodist Rehab Gift Shop and a portion of sale proceeds will benefit the Wilson Research Foundation.

# Research

## 2012 Publications and Presentations

(Methodist Rehab researchers' names are in blue type)

### Publications

1. **Chow JW, Yablon SA, Stokic DS.** Coactivation of ankle muscles during stance phase of gait in patients with lower limb hypertonia after acquired brain injury. *Clinical Neurophysiology* 2012;123:1599-1605.
2. **Chow JW, Yablon SA, Stokic DS.** Electromyogram-lengthening velocity relation in plantar flexors during stance phase of gait in patients with hypertonia after acquired brain injury. *Archives of Physical Medicine and Rehabilitation* 2012 (in press).
3. **Gontkovsky ST.** Auditory/verbal learning and memory deficits among individuals with traumatic spinal cord injuries may be attributable to undocumented traumatic brain injuries. *Functional Neurology, Rehabilitation and Ergonomics* 2012;2:9-16.
4. **Howard C, Wallace C, Stokic DS.** Lower limb preference on goal-oriented tasks in unilateral prosthesis users. *Gait and Posture* 2012;36:249-253.
5. **Leis AA, Stokic DS, Petzold A.** Glial S100B is elevated in serum across the spectrum of West Nile virus infection. *Muscle and Nerve* 2012;45:826-830.
6. **Leis AA, Stokic DS.** Neuromuscular manifestations of West Nile virus infection. *Frontiers in Neurology* 2012;3:37.
7. **Lim YT, Chow JW, Chae WS.** Lumbar spinal loads and muscle activity during a golf swing. *Sports Biomechanics* 2012;11:197-211.
8. **Nevels RM, Williams BE, Gontkovsky ST.** Paroxetine—the antidepressant from hell? Probably not, but caution required. *Psychopharmacology Bulletin* 2012 (in press).
9. **Nevels RM, Hancock A, Spofford JL, Atherton B, Gontkovsky ST.** Adverse drug events associated with anticonvulsants. In: Berhardt LV, ed. *Advances in medicine and biology*. Hauppauge, NY: Nova Science, 2012:89-112.
10. **Nevels RM, Spofford JL, Smith ML, Gontkovsky ST.** Psychosocial and psychopharmacological treatment of comorbid aggression in pediatric mental retardation and other pervasive developmental disorders. In: Mancini DF, Greco CM, eds. *Intellectual disability: management, causes and social perceptions*. Hauppauge, NY: Nova Science, 2012:95-124.
11. **Ryan JJ, Gontkovsky ST, Kreiner ST, Tree HA.** WAIS-IV performance in relapsing-remitting multiple sclerosis. *Journal of Clinical and Experimental Neuropsychology* 2012;34:571-579.
12. **Silva MA, Nakase-Richardson R, Sherer M, Barnett SD, Evans CC, Yablon SA.** Posttraumatic confusion predicts patient cooperation during traumatic brain injury rehabilitation. *American Journal of Physical Medicine and Rehabilitation* 2012;91:890-893.
13. **Stokic DS, Yablon SA.** Effect of concentration and mode of intrathecal baclofen administration on soleus H-reflex in patients with muscle hypertonia. *Clinical Neurophysiology* 2012;123:2200-2204.
14. **Umfleet LG, Ryan JJ, Gontkovsky ST, Morris J.** Estimating WAIS-IV indexes: Proration versus linear scaling in a clinical sample. *Journal of Clinical Psychology* 2012 (in press).

### Presentations

1. **Chow JW.** Quadriceps force control impairments in stroke. *Lecture presented at the 4th International Symposium on Rehabilitation Research, Luncheon*, South Korea, November 2012.
2. **Critchfield E, Nakase-Richardson R, Sherer M, Barnett SD, Evans CC.** Does early neuroimaging predict duration of PTA among neurorehabilitation admissions? *Poster presented at the annual meeting of the American Psychological Association*, Orlando, FL, August 2012.
3. **Gontkovsky ST, Livneh H, Stokic DS.** Social support seeking as a contributing factor to depression in SCI. *Poster presented at the annual meeting of the American Psychological Association*, Orlando, FL, August 2012.
4. **Gontkovsky ST.** Advantages and disadvantages of independent practice in psychology. *Symposium presented at the annual meeting of the American Psychological Association*, Orlando, FL, August 2012.
5. **Leis AA, Szatmary G, Ross MA, Stokic DS.** West Nile virus infection and myasthenia gravis. *Poster presented at 12th International Conference on Myasthenia Gravis and Related Disorders*, New York, NY, May 2012.
6. **Leis AA.** Anterior horn cell disorders: West Nile and Polio. *Course presented at the annual meeting of the American Association of Neuromuscular and Electrodiagnostic Medicine*, Orlando, FL, October 2012.
7. **Leis AA.** Basic and special nerve conduction studies of lower limb nerves. *Course presented at the annual meeting of the American Association of Neuromuscular and Electrodiagnostic Medicine*, Orlando, FL, October 2012.
8. **Leis AA.** Head and neck neuropathies. *Course presented at the annual meeting of the American Association of Neuromuscular and Electrodiagnostic Medicine*, Orlando, FL, October 2012.
9. **Stokic DS.** The effect of intrathecal baclofen concentration and mode of administration on H-reflex for management of spasticity in acquired brain injury. *Lecture presented at the 7th World Congress of Neurorehabilitation*, Melbourne, Australia, May 2012.
10. **Stokic DS.** The effect of intrathecal baclofen concentration and mode of administration on H-reflex for management of spasticity in acquired brain injury. *Lecture presented at the 3rd Asia-Oceania Conference of Physical & Rehabilitation Medicine*, Bali, Indonesia, May 2012.
11. **Stokic DS.** Left dorsolateral prefrontal cortex is involved in motor imagery. *Poster presented at the joint annual meeting of the American Society for Neurorehabilitation and American Congress of Rehabilitation Medicine*, Vancouver, Canada, October 2012.
12. **Stokic DS.** Motor imagery and restoration of movements: implications for clinical practice. *Lecture presented at the 2nd International Symposium "Research in Neurorehabilitation"*, Belgrade, Serbia, November 9, 2012.



## Wilson Research Foundation Honorarium

Our donors help our patients recover ability and recover hope through research at Methodist Rehab Center. 'Research Fellows' are those who have given \$1,000 or more to this life-changing work. Gifts listed below are those received since the last published list that appeared in the Winter 2012 issue of Ways & Means. We strive for accuracy, so please let us know if we have neglected to recognize your contribution.

To make a donation or to learn more about The Wilson Research Foundation, contact Chris Blount or Juanita Lester at (601) 364-3598 or email [wfgift@wilsonfoundation.org](mailto:wfgift@wilsonfoundation.org). Or, you may make a secure online donation with your credit card: [www.wilsonfoundation.org](http://www.wilsonfoundation.org)

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