

NEUROLOGY/STROKE

Birmingham Rehabilitation Centers Respond to Shift in Philosophy With Stroke Rehabilitation

BY ANN B. DEBELLIS

As more research shows how the brain responds to injury by reorganizing its plasticity, scientists from the National Institute of Neurological Disorders and Stroke (NINDS) are sponsoring research on the restoration of function after a stroke. Such research has led the way for other studies, such as one conducted by Lynne Gauthier and colleagues in the Department of Psychology at UAB that shows the magnitude of clinical improvement achieved during stroke rehabilitation is directly proportional to structural modeling of the brain.

These and other studies are leading health professionals to change the philosophy for treating stroke patients. They are moving from the traditional compensation approach to functional neuro-recovery, which works with the affected part of the body to rewire path-



Noelle Ward, Director of Therapy at HealthSouth Lakeshore Rehabilitation Hospital, uses the SaeboFlex in therapy with a patient following a stroke.

ways of nerve impulses that have been affected by injury, and to recruit new areas within the central nervous system to take over control of an affected arm or leg. To achieve success, early intervention is required for these patients, often within hours of their arrival at the hospital.

"We used to believe there was no

chance for recovery in these patients, but that concept has changed now that we know the brain cells can reorganize," says Emily Riser, MD, a neurologist at HealthSouth Lakeshore Rehabilitation Hospital. "Following the initial resolution of swelling in the brain and reperfusion, we've found we can recruit other brain cells to take on activities they've never performed before. This is the basis for a strategy called 'Constraint-Induced Therapy' which forces the patient to use the

weak limb, which, in fact, recruits new neural networks in the brain."

With this shift in philosophy has come the development of a variety of devices that improve rehabilitation outcomes for patients. One such device now in use at UAB's Spain Rehabilitation Center is the TheraStride body-weight support treadmill system, which allows

physical therapists to concentrate all their efforts on helping patients improve balance and walking, and to increase weight-bearing abilities for standing.

"This system is revolutionizing how clinicians rehabilitate patients with mobility impairments," says UAB physical therapist Cathy Carver. The TheraStride combines a treadmill and support harness system with computer software that measures variables of gait training, including speed, weight support, the amount of time walked, and the amount of assistance needed while walking. It helps therapists provide hands-on training to restore function. "The TheraStride machine is an integral component of what is referred to as locomotor training—learning how to walk again following neurologic damage," Carver says. "Combined with the proper therapeutic skill, this device will help patients recover the proper kinematics of walking, rather than simply helping them learn to compensate with walkers, canes or other assistive devices."

Continued on page 6

Birmingham Rehabilitation Centers Respond to Shift, *continued from page 4*

In the past, therapists trained these patients using a regular treadmill and an old body weight system that didn't have the ability to tell them how much body weight was being removed and was missing important components for safety and training. This new system provides advantages for both the patient and therapists. "We've seen good results with the TheraStride system," Carver says. "After a stroke, patients sometimes learn compensatory strategies such as hip-hiking, excessive trunk rotation, and uneven step lengths making their speed slow and unsteady. After training on the TheraStride, we've seen great improvements on stepping patterns, speed and balance, with a subsequent decrease in falls."

Therapists at Lakeshore use a similar device called the AutoAmbulator™ to help patients replicate normal walking patterns. The machine's computerized sensors track numerous functions, continually monitoring and adjusting power and speed according to each patient's physical requirements. "There is a generator in the spinal cord that can take over function when the brain is damaged, and these types of machines are helping this to occur," Riser says. "I think these devices will be part of our mobility protocol going forward."

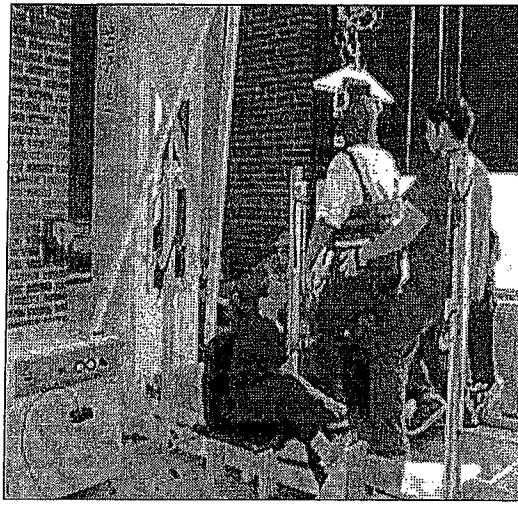
Lakeshore also uses a NESS L300, an advanced neuroprosthetic designed to enable a more natural gait. Worn on the lower leg and foot, this device pro-

vides real-time gait recognition and allows patients to automatically adjust to different surfaces, walking speeds, and uneven ground. Lakeshore uses other devices to target specific areas of the body, such as upper extremities and shoulders, lower limbs, and speech difficulties.

"We didn't have these technologies five years ago," says Noelle Ward, Director of Therapy at HealthSouth Lakeshore Rehabilitation Hospital. "We are excited to have several therapists trained in these new rehab strategies, who in turn educate patients. That translates into an improved rehabilitation outcome."

Occupational therapy is also necessary for stroke patients, and therapist Delores Kinsley-Green of Encore Rehabilitation in Decatur uses traditional neurological techniques to help patients regain weak side movement and perform activities of daily living. "I use inhibition and facilitation on weak arms, and we also do weight bearing to strengthen the limb," she says. "We use techniques to work on core strength and balance as well."

Splinting is another technique Kinsley-Green uses to help stroke patients regain their ability to walk and keep



UAB physical therapist Cathy Carver, left, and other therapists work with stroke patient London Jones on the TheraStride system.

their balance. Splints can also be used to control movement of weak joints, especially the wrist and ankle. Exercise and pool therapy are also tools she uses to help patients regain movement.

"We also work on problems these patients have doing normal activities at home, such as doing the laundry. These are just basic things but they make a big difference for these patients," Kinsley-Green says.

Riser believes we are at the forefront of the neurorehabilitation process and has seen it take off in recent years.

"The key is early intervention and initiation of strategies that will ensure the best possible clinical outcome," she says. As the neurologist, Riser helps identify any comorbidities the patient may have that could affect rehabilitation as well as any risk factors that might lead to another stroke. "Until you reduce those risk factors, you can't be assured of the best possible outcome."

Setting reasonable goals for the patient and family is an important part of the rehab process, and Riser works with the other professionals of the multidisciplinary team to

educate the patient and family about clinical expectations. "It is important for there to be a cohesive rehabilitation plan to enhance recovery, both in the inpatient and outpatient setting," she says. The stroke team at Lakeshore is committed to this process and has recently been awarded The Joint Commission Disease Specific Care Certification for stroke rehabilitation.

Thanks to medications given at the onset of a stroke and these new rehabilitation strategies that improve plasticity, a patient's central nervous system can be altered so that it can recover. It is critical, however, that the patient seeks medical treatment immediately, because what happens in the first hour following a stroke can determine the level of recovery a patient can expect. "Time lost is tissue lost," Riser says.

Riser has seen many changes in her 25 years of practicing neurological medicine, and she is excited to see how far stroke rehabilitation has come. "Stroke rehab used to be so fragmented. Now, we use a more longitudinal strategy for recovery, initiating rehabilitation in the acute phase of stroke care and continuing the process even after discharge from the hospital," she says. "Early intervention in stroke recovery is essential, and the model of multidisciplinary care using new strategies is translating into improved outcomes for the individual following a stroke."