



The University of North Carolina Department of Physical Medicine & Rehabilitation
 “Optimizing Health and Function through Excellence in Rehabilitation”

New Home, Same Heart

TBI Survivor Embraces Independent Living, Pursues Education to Help Others with Disabilities

On a fall evening, Brittany Stone returns to a two-story home she shares with a room-mate in the surrounding countryside of Chatham County. Today she has attended her African-American history class at UNC-Chapel Hill – a commute of about 20 miles. Tomorrow, with the help of a caregiver and aid of a scholarship, she will commute the same distance to exercise at the UNC Hospital’s facility at Meadowmont.

Stone is bravely continuing her college education and fostering her new independence following a severe traumatic brain injury (TBI) in 2004.

In many ways, Stone embodies the struggle of the typical young college student who recently discovers the pros and cons of life on one’s own.

“I’m living in my own house, but I have to clean up and be responsible,” she says. “I have a 10-page paper for my history class that I’m typing myself,” Stone adds. “I tried assistive technology, but I prefer to type with two fingers. I still finish assignments on time.”

Between her brilliant wit and persistent spirit, Stone recalls the “horrific evening with torrential rain,” exactly 14 days after her high school graduation – the night of the *peripeteia* (transformative event).

“I was driving. I couldn’t see anything,” she remembers. She and her sister, whom she had just picked up from vacation bible school, hit a pot hole, sending the car into several trees. Luckily, her sister was unharmed, but the accident left Stone in a coma.



Brittany Stone (left) and her caregiver Marguerite Vasquez from the local Arc share a laugh at the UNC Hospital facility At Meadowmont. Vasquez, a senior at UNC majoring in psychology, drives Stone to the gym three times a week, as well as to a student’s other necessary destinations: class, shopping and lunch out.

⇒ **Brittany Stone’s story continues on page 2.**

Support Makes Difference for Patient Growing Up with TBI



On his 50th birthday, Dan Weathington was traveling by plane to Kansas City. Suddenly, an official asked him to step aside.

“I thought, ‘I bet they have found my pocket knife in my suitcase,’” Weathington recalls. “But they told me that my niece, Morgan, had been in an accident.”

⇒ **The Weathingtons’ story continues on page 3.**

Brenda and Dan Weathington (middle) celebrate their son’s college graduation as a family. Morgan (right) carries on the family tradition as a successful student in the ninth grade.

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From the Director



Michael Y. Lee, MD, MHA

Dear Friends,

With this issue of the *Rehabilitation Reader*, we are beginning a new thematic series. This quarter we discuss various perspectives on traumatic brain injury—also known as TBI—from the view of patients, families, and specialists. In our spring issue, we will continue the conversation around another kind of brain injury – stroke. As we grow in our external outreach, please feel free to offer your suggestions and feedback using the self-addressed, postage-paid envelope or email us at rehab_reader@med.unc.edu. I look forward to your comments and ideas.

I also would like to thank all of the volunteers and donors who contributed to the 2007 Honors Golf Tournament, including our speaker, Brittany Stone (featured in this newsletter). The proceeds from this event will support brain injury programs in the department, including educational materials to help patients and families adapt, as well as staff training to improve care for our TBI patients.

While the tournament was a success, there are a lot of other needs within the TBI program. These include outreach efforts such as TelAbility, funds to help patients cover rehabilitation costs, and other educational materials. If

you would like more information, please contact our Director of Development, Nicole Pratapas, at 919-966-8494 or email to nicole_pratapas@med.unc.edu.

You also may fill out the enclosed pledge form to make a tax deductible donation to one or more of our programs. Any amount will help our patients become more functional along the continuum of care.

In the meantime, I wish you a happy and healthy new year!

Michael Y. Lee, MD, MHA
Professor and Chair
Physical Medicine & Rehabilitation

New Home, Same Heart (continued from page 1)

Stone now knows all of the areas involved in recovery: "It affected my speech, motor abilities, cognition, visual perception, interpretation, and emotions," she says.

But she also remembers who she used to be: "I have the same heart and inner beauty," she adds.

It was this inner beauty she revealed at a recent fundraising event for TBI research and education for the UNC Department of Physical Medicine & Rehabilitation. Stone challenged participants to "decide to be happy" and to see struggle as an opportunity to grow as a person.

Because of her commitment to her college education, Stone finds little time to focus on her physical recovery.

"I personally have difficulty distinguishing time between recovery, re-

sponsibilities, homework, class, studying, and fun/relaxing time," she says. "I tend to think most students do."

On the other hand, Stone sees completion of her studies as an opportunity to help others.

"I find neurology and neuropsychology the most intriguing," she says. "I'm also interested in public speaking on behalf of people with disabilities."

Karla Thompson, PhD, neuropsychologist in the Department of Physical Medicine & Rehabilitation as well as the Department of Psychiatry, worked with Stone on the cognitive and emotional aspects of her recovery.

"People with severe traumatic brain injuries can make remarkable recoveries," Thompson says. "There's the saying: It's not the injury; it's the head. A person's attitude can predict recovery, as well as support systems."

One way the Department of Physical Medicine & Rehabilitation enables patients to inspire each other along the road to recovery is through a monthly brain injury support group.

"When Brittany comes to the brain injury support group, she always provides encouragement," Dr. Thompson adds. "Brittany says, 'Never give up' with great intensity."

Stone expands on her personal inspiration: "God has an ultimate plan for each of us," she says. "Through this milestone my faith is extending and the purpose for myself is becoming more and more apparent."

For more information about the Brain Injury Support Group, contact Karla Thompson, PhD, in the Department of Physical Medicine & Rehabilitation at 919-966-9501 or email your questions to rehab_reader@med.unc.edu.

"Through this milestone my faith is extending and the purpose for myself is becoming more and more apparent."

—Brittany Stone

Support Makes a Difference (continued from page 1)

Weathington learned that Morgan's father, his brother-in-law and a single parent, had been taking Morgan to daycare when a gravel truck driver, racing with another empty truck, hit their vehicle at a high speed. Morgan's father did not survive, while Morgan, then age 4, stayed in intensive care at UNC Hospitals for 12 days, receiving 180 stitches above her forehead and other surgeries.

At that time, Dan and Brenda Weathington volunteered to raise Morgan. Their own son, then in 6th grade and now a graduate of the University of North Carolina Wilmington, never complained about adopting a new sister.

"We are committed to keeping Morgan as long as she needs to stay at home," says Brenda Weathington.

Morgan has continued her rehabilitation with outpatient visits to Dr. Joshua Alexander, MD, for 11 years.

"Dr. Alexander and his team have continued to encourage us," Dan Weathington says. "We're exceptionally proud of what Morgan has accomplished."

So too is Dr. Alexander, who keeps copies of Morgan's recent report cards—all A's—and an article when Morgan was honor roll student of the month at Lumberton Junior High. Now 16 and a 9th grader, Morgan continues to work hard in a diverse public high school in Robeson County.

"Morgan has good recognition of her cognitive strengths and weaknesses," Dr. Alexander says. "She sees her weaknesses as challenges. Though she might not attain the same level of independence as she would have, if not for this terrible accident, her achievements are to be celebrated."

"The support that Morgan has received from her aunt, uncle and cousin is a model of what I'd wish to see in every family of a child who's had a brain injury," Dr. Alexander continues. "We know that one of the factors predicting recovery and future independence is a supportive family."

Brenda Weathington, a school-teacher by profession, advocated for Morgan early on, both for appropriate services at school and for courteous treatment in society.

"One day at church, I heard a boy teasing Morgan," she recalls. "I reminded him that Morgan had lost her daddy and that he was blessed to have his daddy. I explained that Morgan was also blessed, so he didn't need to be mean to her."

"We expect the very best from Morgan in both behavior and academics," Brenda Weathington continues. "She went from a five-year-old who could hardly hold a pencil, and now has beautiful handwriting."

Thanks to this constant support, Morgan in many ways is a typical teenager, following her favorite pop stars on the Internet, watching movies, and attending out-of-state field trips.

"The support has helped a lot," says Morgan. "I feel that I have about the same independence as most teenagers, and many friends of different backgrounds and ages."

Some of her best friends are in the twelfth grade, helping her keep an eye on college. Now on the occupational track in high school, Morgan plans to attend college to prepare for a technical career.

"The support that Morgan has received from her aunt, uncle and cousin is a model of what I'd wish to see in every family of a child who's had a brain injury."

—Dr. Joshua Alexander



Joshua Alexander, MD, and one of his young patients

Joshua Alexander, MD, recently was selected by his peers to be included in the Best Doctors in America 2007-2008 database, which contains the names of 40,000 doctors who "provide a unique combination of medical experience, skill and insight" to help patients manage complex medical problems. As one of the few pediatric psychiatrists in the state of North Carolina, Dr.

Alexander is an advocate both for his young patients and the families that support them. His TelAbility program (www.TelAbility.org), provides telemedicine consultations to patients across the state, in their own communities via internet-based video conferencing. TelAbility also runs programs that enhance communication, care coordination and professional education for parents and care providers of young

children with special needs in North Carolina. Much of the costs associated with establishing these programs, and expanding them across the state, are funded through the generous support of donors. Please consider helping Dr. Alexander by making a donation to this project. For additional information about donations, contact Nicole Pratapas, Director of Development, at (919) 966-8494 or email to nicole_pratapas@med.unc.edu.

Rehabilitation Nurses Join Statewide Efforts to Educate about TBI

“Every teenager we met knew at least one person with the symptoms of a brain injury.”

—Donna Jernigan

In addition to treating patients recovering from a traumatic brain injury (TBI), nurses in the UNCH Inpatient Rehabilitation Center are participating in several community initiatives to prevent the accidents that cause trauma to the brain.

Donna Jernigan, MS, BSN, RN, CRRN, patient services manager, participates in a local chapter of Think First, a program of the National Injury Prevention Foundation. The program helps teachers weave safety topics, such as helmet use, into the curriculum from preschool to the secondary levels.

Rebecca Crane, BSN, RN, CRRN, assistant nurse manager, has joined Trauma Team Talks Tough (also known as T4), a UNC Hospitals injury prevention initiative targeted toward teens. Participants discuss prevention of the behavior that causes brain injury, such as gun violence or drug abuse.

“Participation by rehab is critical because they see the net impact on patients and families more than those who work in emergency and critical care,” says Jeff Strickler, RN, MA, clinical director of emer-

gency services for UNC Hospitals and also a trainer for T4.

According to the Brain Injury Association of North Carolina, TBI remains the leading cause of death for young people 15 to 24 years of age. The association plans to introduce legislation within the next two years to track TBI patients and improve services across the state.

“We would like to have a state registry, as many states do, for brain injury cases,” says Sandra Farmer, director of the Brain Injury Association of North Carolina. “We have seen an increase in awareness, partly because there are a tremendous number of American soldiers coming back from the war areas with traumatic brain injuries.”

Janice White, TBI prevention program coordinator for the Division of Mental Health, Developmental Disabilities and Substance Abuse Services, has been organizing activities with other associations across the state to prevent TBI in all populations, from prenatal to geriatric. According to her division’s website, TBI is the “silent epidemic.”

In her newly created position, White is spreading the word that TBI is a life-span issue. According to the Centers for Disease Control and Prevention, falls have overtaken car crashes as the leading cause of TBI in the United States, partly because of the graying of America, but also as a growing hazard for infants. “We’re working with other organizations to be sure TBI is part of a broader education effort, from pre-schools to the elderly,” she says.

Meanwhile, with educational efforts from UNCH rehabilitation nurses, prevention information aims to lower the number of cases in our own backyards.

“Every teenager we met knew at least one person with the symptoms of a brain injury,” Jernigan notes of a recent visit to driver education classes at Western High School in Harnett County. “It will take a concerted effort by UNC to get injury prevention information in every high school in the state, but that’s what we’re trying to do.”

References:

www.bianc.net www.cdc.gov/ncipc/tbi/TBI.htm www.ncdhhs.gov/mhddsas/tbi/index.htm www.thinkfirst.org www.unctraumaprogram.com

Inpatient Rehabilitation Center Treats Growing TBI Population

The Inpatient Rehabilitation Center continues to treat a gradual influx of patients with traumatic brain injury (TBI). From July 2006 through June 2007, 74 percent of TBI patients treated at the center returned to their communities, the same as the national average. The average length of stay was 15 days, compared to 17 days nationwide.

“We’ve made an effort partnering with neurology and neurosurgery to bring more TBI patients who fit into our program,” says Donna Jernigan, MS, BSN, RN, CRRN, patient services manager for the center. “We have seen an increase in TBI patients as well as an increase in severity.” Jernigan cites education about the center’s services as an important factor in the growth of TBI patients. In the near future, plans are underway to train all rehabilitation nursing assistants to be one-on-one sitters for TBI patients when the need arises. “Right now the sitter cases go through the

main hospital staffing office,” Jernigan notes. “We’d like to be able to pull from our own staff, who have been trained in TBI care and have an interdisciplinary orientation.”

Another initiative is helping families and patients prepare for discharge earlier. “We have a new committee that keeps patients and families more aware of when discharge will come, from the very beginning,” says Judith Young, BSN, RN, care coordinator on the clinical care management team. Young organizes a family care conference with patients, family members, and other partners along the continuum of care early in the rehab stay to discuss future options. For TBI patients, this is especially critical, as family will assist both with physical and mental challenges. “We want to allow plenty of time for families to prepare to help their loved ones,” Young says. “Meanwhile we work on extending the chance of more independent living.”

Physiatrists Provide Early Consultation and Specialized Care for TBI Patients

Doctors who help patients with rehabilitation following an injury or illness – also known as physiatrists – manage all aspects of care, including services for patients with mild to severe traumatic brain injuries (TBI).

“We consult as early as possible,” says Tanya Zinner, MD, of the Department of Physical Medicine & Rehabilitation. “We can start some of the medications and treatments before patients come to the Inpatient Rehabilitation Center. We work with the therapists to initiate appropriate physical, occupational and speech therapy. We also monitor tone and work on appropriate positioning and splinting as needed.”

In addition, physiatrists in the department educate nursing staff on the acute floor and begin educating family members about TBI, including what to expect during recovery, and how family members can help the patient.

“For example, it is important to try to maintain a quiet environment and limit the number of visitors and amount of distractions when the patient is agitated,” Zinner says.

Once TBI patients come to the Inpatient Rehabilitation Center, physiatrists manage a host of factors that impact the rate of recovery. Heather Walker, MD, of the Department of Physical Medicine & Rehabilitation, specializes in injuries to the nervous system and the brain.

“When patients come from ICU, their sleep-wake cycles are often switched,” Walker explains. “We provide a quiet room and, if necessary, medications to help TBI patients sleep.”

Exercises during the day also acclimate TBI patients to a regular schedule, as well as help with fatigue, a common side-effect of a brain injury.

Another issue upon arrival to the Inpatient Rehabilitation Center is safety, according to Walker.

“Patients have post-traumatic amnesia, and may suffer from agitation and confusion,” she notes. “We provide an enclosure bed that allows safe freedom of movement and prevents falling.”

“For agitation we use the newer medications,” Walker continues. “These have fewer side effects and have less potential to inhibit functional recovery.”

Walker and Zinner work with psychologists and social workers, as well as other therapists and a nurse case manager, to provide several conferences with family members. They also plan for discharge from the hospital using the same interdisciplinary team approach.

“I enjoy seeing how TBI patients begin to get their memory back,” Walker says. “They slowly wake up from post-traumatic amnesia (PTA), and once they emerge from PTA, patients show progressive

cognitive and functional improvements.”

Walker notes that symptoms often include increased muscle tightness (spasticity) following injury, which can be minimized with oral medications and other treatments such as botulinum toxin injections or continuous delivery of baclofen directly through the spine (the intrathecal baclofen pump) when spasticity is not controlled by oral medications. “We also use some of the better bracing systems and assistive devices,” she adds.

Complications that may arise after discharge which need immediate treatment include functional decline, seizures, changes in bowel and bladder function, headaches (especially with nausea), new weakness, changes in cognitive function, and emotional changes (such as depression).

“Patients need to follow up monthly while in therapies, then every two to three months, then six months, and eventually yearly,” Walker says. “I encourage patients to continue to check in at least once a year, because we like to be sure people are maintaining their current strength with an exercise program at home, and maximizing functional abilities.”

Zinner agrees: “Keeping fit, both mentally and physically, and checking in regularly with a physiatrist, has a profound effect on maximizing quality of life.”



Heather Walker, MD



Tanya Zinner, MD

“Keeping fit, both mentally and physically, and checking in regularly with a physiatrist, has a profound effect on maximizing quality of life.”

—Dr. Tanya Zinner

Neurologic Physical Therapy Complements the Team Approach

“By actually going out and doing a task rather than planning a task sitting down,” Stephens explains, “the patient has a better chance of remembering all aspects of the journey.”

—Katie Stephens

TBI patients will meet Katie Stephens, PT, NCS, a board certified clinical specialist in neurologic physical therapy.

Stephens finished an additional neurological residency at MossRehab in Philadelphia, Pennsylvania after completion of her masters in physical therapy at East Carolina University. She helps each TBI patient literally “walk through” a daily routine by working closely with other therapists while focusing on the physical aspects of recovery.

“Our goal is restoration of normal movement in an interdisciplinary environment,” Stephens says.

She sums up the possible misconceptions of people with traumatic brain injury: “A lot of our TBI patients come in walking. So it’s easy to look at someone with a brain injury and not know that anything has happened.”

Stephens gets below the surface, however, to “go beyond what we normally do in physical therapy.” “Just because a person can walk

from point A to point B doesn’t mean they remember how they got there and how to get back,” she notes.

For example, a patient with damage to the cerebellum, the part of the brain that controls body coordination, can practice walking to the hospital gift shop. Stephens will teach the patient how to overcome vertigo and other balance problems, while other therapists may help with speech and counting change.

“By actually going out and doing a task rather than planning a task sitting down,” Stephens explains, “the patient has a better chance of remembering all aspects of the journey.”

Stephens also monitors the physical challenges of patients with behavior changes following a brain injury, and often works with the team to develop a behavior contract complete with relevant rewards, such as time to watch TV or to play the piano.

While under her care, each patient

learns a specific exercise program, which outpatient physical therapists incorporate after discharge from the hospital.

“Exercise prevents depression and isolation, while contributing to better overall mental health,” Stephens notes.

Stephens also has worked to promote and develop TBI education in the community since beginning her job at the UNCH Inpatient Rehabilitation Center in 2004.

During Brain Injury Awareness Month in March, she distributes the hunter green bands with the motto “Mind Matters” along with information to support patients with brain injury and their families, and to educate staff and the community.

“We play TBI Jeopardy to check how many facts our staff has retained,” she says.

“Every patient with a brain injury is different,” Stephens adds. “My challenge is to help each patient get better.”



Karla Thompson, PhD, and Katie Stephens, PT, NCS, pose in one of the four TBI rooms.

Quieter Rooms for TBI Patients Promote Recovery

The Inpatient Rehabilitation Center features four private rooms designed specifically for patients with traumatic brain injury (TBI). The rooms allow freedom of movement within a safe area, which can be monitored by camera or by a nursing assistant who stays with the patient. Neutral colors and the private setting limit environmental stimulation to promote a quiet, healing environment.

“I can remember a TBI patient who didn’t under-

stand what had happened to him after a car accident,” says Donna Jernigan, MS, BSN, RN, CRRN, Patient Services Manager at the Inpatient Rehabilitation Center.

“He had become combative and agitated, and his wife couldn’t understand why,” Jernigan continues. “We explained to him, and to his wife, why his behavior had changed, through a Spanish interpreter. Within 24 hours he became a whole

other patient. His behavior became more manageable, and within two weeks he went home with his family.”

Jernigan attributes his quick progress to the quieter, soothing rooms for TBI patients and a team effort to ensure that family members receive the education necessary to help them through the recovery process.

Speech Therapist Focuses on Re-entry into the Community for Each TBI Patient

"A professor of mine once said, 'You know one person with a brain injury and you only know one,'" says Antje Thiessen, MS, speech language pathologist in the Inpatient Rehabilitation Center. "Patients with brain injuries show widely different constellations of symptoms."

Originally from Germany, Thiessen completed her education at UNC, including a clinical fellowship in acute and inpatient rehabilitation, where she learned critical interventions to help patients with traumatic brain injury (TBI).

Now working with the UNCH rehabilitation team for several years, she recently attended "Brain Injury 2007: Where We've Been and Where We're Going," presented by the Brain Injury Association of North Carolina and Wake AHEC in November 2007.

"One presentation focused on why the majority of people with TBI struggle after their discharge from the hospital," Thiessen says. "It highlighted that social networks at home and on the job, as well as transportation, are essential to leading a happy, successful life in our society."

"Most people with TBI are lacking many or all of these community support systems that could

extend the continuum of care," she continues. "It is important to provide patients and families with as many resources for the future as possible."

From Thiessen's perspective, these resources—such as written education, support groups, transitional living arrangements and vocational rehabilitation—not only determine successful community re-entry, but also provide opportunities to hone reading and reasoning skills.

"Language and cognition are inseparable," Thiessen notes. "We show memories through speech, and we reason out loud."

"Once patients move to the Rehabilitation Center, they begin filling in memories, but the full consequences of the injury have not set in," she explains. "Patients don't understand their new limitations or why they need rehabilitation; they just want to go home. We increase awareness through education and orientation, which improves motivation to heal."

Thiessen also uses visual reminders, approved by the family, that may include calendars or signs reminding patients what caused the TBI or a list of tasks for the day. Patients typically keep memory books that include their schedules, informa-

tion about different therapists on the rehabilitation continuum, homework to regain organizational skills, and journaling assignments.

Opportunities for social interaction transpire in group therapy sessions, which Thiessen arranges for patients while in the center. Such interaction creates bonding and psycho-social support for improving speech. "For example, some patients relearn how to inhibit inappropriate speech," she says. "This 'rewiring' of the brain happens with cues from others."

"We try to mimic tasks that people need to do at work, in a social setting that requires multitasking," Thiessen adds. "We may ask someone to write a summary paragraph on the computer with other distractions around, just as they might encounter on the job."

Thiessen anticipates growth both in the spectrum and number of TBI patients coming to UNC Hospitals. "We're trying to identify anyone who has bumped the head, from mild concussions to patients showing coma response," she says. "With additional infrastructure and community support, we could expand our rehabilitation services to serve a broader population of TBI patients."

Occupational Therapist Helps TBI Patients Safely Transition to Daily Routines

"I enjoy seeing the progress of a patient and love to share the happiness of the patient, family and friends as they see improvements with therapy," says Kevin Corbin, OTR/L.

As the senior occupational therapist at the UNCH Rehabilitation Center, Corbin acquires new experiences with every incoming patient. He has a BS in Occupational Therapy from Concordia University in Wisconsin and has been practicing for about ten years. His rehabilitation experience ranges from amputee to traumatic brain injury (TBI) patients.

"Generally with TBI patients we need to be very concerned with safety since impulsivity is a common symptom," Corbin states. "With this in mind, we work on self-care and activities of daily living."

Corbin uses adaptive equipment to extend reach and decrease bending, helping prevent future falls and possible re-injuring of the brain. "We use

sign boards to help with recall, as well as simple commands and choices based on the current level of the patient," Corbin continues.

Many daily routines are practiced using the therapy gym and gadgets that can be helpful in a patient's transition back to home life. Corbin also incorporates skills such as money management, safety in the kitchen, and appropriate choices in the community.

"I have grown to appreciate how fragile life can be but also how resilient the human body is," Corbin notes.

"On rehab here at UNC we work very well with a true interdisciplinary format," Corbin notes. "This approach helps to ensure the very best care is provided to this challenging and rewarding patient population." —Story by Ramona Moraska



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Physical Medicine & Rehabilitation Research

Abstract from: Complementary Therapies for Traumatic Brain Injury

By Susan Gaylord, PhD, Kim Faurot, MPH, Jongbae Park, KMD, PhD, & Eric Garland, MSW

Complementary and alternative medicine (CAM) often may be combined with mainstream treatments to reduce symptoms and enhance recovery of function in people with traumatic brain injuries (TBI). CAM therapies include dietary therapies, mind-body therapies, body work, and energy therapies. Some CAM therapies can be used to improve overall well-being, thus helping the body heal. For example, a good diet with whole grains and plenty of fruits and vegetables can improve health and increase energy. Similarly, mindful exercises such as yoga and tai chi improve flexibility and balance. Massage can lower stress and increase relaxation. Aromatherapy can help some patients feel calmer, though more research is needed.

Recent research suggests that mind-body interventions such as mindfulness meditation and clinical hypnosis may be effective for the treatment of TBI and its associated symptoms. Mindfulness meditation has been shown to be effective in improving attention function, which is often impaired in TBI. Clinical studies have found mindfulness to reduce anxiety, distress, and depression and improve sense of well-being. Hypnosis has been shown to help patients manage pain and other symptoms of TBI.

Scientists think that mind-body interventions such as meditation and hypnosis may trigger changes in the brain by stimulating neuroplasticity, or the growth and organization of neurons. In this respect, mind-body interventions might work to help TBI patients in the same way that rehabilitation has been found to help stroke patients, by stimulating neuroplastic regeneration of the brain.

Other CAM approaches have been explored for their use in relieving symptoms associated with TBI. Because craniosacral therapy (CST) has helped some people with headaches, a study underway at the UNC Chapel Hill is investigating the use of CST for migraine headaches. Further research is needed to determine its effectiveness for TBI-related headaches. Homeopathy may be effective in reducing mild chronic TBI symptoms, as shown in a small controlled research study; further research is needed to confirm this finding.

Acupuncture and acupressure may be considered as options to manage some symptoms of TBI including headache, chronic pain, ringing in the ears, fatigue, sleep patterns, and behavioral or mood changes. While acupuncture is widely used in the management of pain and the evidence of its effectiveness is well documented, its use specifically for TBI is somewhat rare in the United States. One case study reported rapid and significant improvements in pain and mood of a TBI patient during a course of acupuncture treatment. In South Korea, TBI patients can receive a range of comprehensive care including acupuncture and herbal medicine through health insurance. Research on this topic will shed more light on the possibility of further use of acupuncture for TBI.

⇒ To request the full article with a complete list of references, email to rehab_reader@med.unc.edu or write us using the self-addressed, postage-paid envelope in this newsletter.

The Program on Integrative Medicine in the Department of Physical Medicine & Rehabilitation supports evidence-based education and research activities in CAM, and encourages the integration of effective therapies into clinical practice. The program's researchers are interested in learning how complementary therapies can be used to help with pain management and recovery from cancer, stroke and TBI.

The program's researchers note that herbal products should be taken with caution and only under the supervision of a healthcare provider, because of the potential for serious side effects and interactions with medications. For example, in research studies, ginkgo biloba has been found to be effective in preventing brain function decline in Alzheimer's patients, but may cause serious bleeding or seizures in com-

bination with other medicine, including aspirin. Additionally, kava is very helpful in reducing anxiety, but has been associated with liver problems in some people. Even relatively safe and soothing herbs like lemon balm and chamomile tea may not mix well with medicines your physician has prescribed.

The Integrative Medicine Consult Service sees patients who would like an integrative approach to their illness. The Mindfulness-Based Stress and Pain Management training program has been successful in helping patients cope with stress, depression and pain related to chronic conditions. For more information about these clinical, research or educational programs, please see the Program on Integrative Medicine's website (<http://pim.med.unc.edu>) or call (919)-966-8586.