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# HEADLINER

Spring 2008  
Vol. X Issue 2

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The Newsletter of the Brain Injury Association of Oregon

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# A New Approach to Walking Again for Those Living with TBI

Finding help for someone to walk or stand again, and going from clinic to clinic looking for answers, may seem like a way of life for family members of those living with traumatic brain injuries.

Faced with the uncertainty as to whether a family member can regain some or most of their functioning to walk or stand again, while simultaneously managing and maintaining the loved one's activities of daily living to the highest possible degree, can be a daunting task.

Bonnie Baker of Eugene knows all too well those experiences from her own personal situation, living with her son Chad Corliss who received a TBI in a car wreck in October 2001 and remained in a coma for 5 months. She and her husband Craig Corliss lived everyday trying to address her son's neurological recovery and mobility issues. When Chad first tried to stand and take steps, three people supported him and one person was at each leg helping him to move. They used gait belts, they installed handrails through their home, and they even taped candy bars to the ceiling to entice him to stand and reach. They rented standing machines used by paraplegics. Physical therapists used traditional methods, culminating with encouraging him to walk using parallel bars. He stood and took a few steps independently, but never progressed beyond that and finally declared that he would not be walking—in fact, that he would rather scoot on the floor. He used a wheelchair 100% of the time for 3 and a half years. Then, Chad stood on his own and began to walk.

At the 6<sup>th</sup> Annual BIAOR Conference in Portland, Bonnie and other family members of those living with TBI watched a video of a young man named Knute who suffered a TBI 23 years ago in a motor vehicle accident. Knute's video footage documented his remarkable progress during the 8 month span from May 2007 until January 2008. In less than one year, Knute has gone from being wheelchair bound to walking over 500 feet per therapy session (see <http://www.youtube.com/watch?v=UkkM1ln7Orw>).

After Bonnie watched Knute's video, she commented that if her son Chad had had access to a Gait Harness System (GHS) when he first tried to walk, he might not have given up on walking for 3 and one half years. She said she hopes therapists who work with brain injured

patients will learn about it and incorporate it into their practices. Bonnie said, "The video footage of brain injured folks using the GHS brought tears to my eyes because it reminds us to never give up and to keep on trying new things."

Using the GHS, many patients are now beginning to walk and stand again for the first time in many years. Cheri Babb, RN and Executive Director, Grace Center for Adult Day Services, in Corvallis; Joe Millen, PT, MTC, Impact Health and Performance, in Palm Harbor, Florida; and Bill Thornton, MPT, Center for Spinal Cord Injury Recovery (CSCIR), the Rehab Institute of Michigan at Wayne State University, Detroit Medical Center, will share with you wide spread examples of clients and therapists using the GHS successfully; examples which have spanned nearly a decade. These clinicians have all worked with TBI and SCI patients who were told they could never walk again, but who are now able to walk again using the GHS.

Other individuals who have suffered TBI's and SCI's and are 5, 10, and 15 years post injury are experiencing similar results. Recovery of function is becoming more common because the GHS allows therapists and patients to work more efficiently together towards a common goal,



walking in the most independent manner possible.

The Grace Center for Adult Day Services in Corvallis is one of the facilities here in Oregon which is making progress in this area. Cheri Babb, Executive Director of The Grace Center, is seeing this first hand. Cheri says, "I asked Second Step to first come to our clinic because they were referred to us by a local hospital that had been using the Gait Harness System. We

had one staff member injured on the job when trying to walk one of our patients, and had a worker's compensation claim approved through SAIF to purchase equipment which would keep her, and the staff, safer from injury. At first, many of my staff were reluctant to try this piece of equipment, until they shared the team experience for themselves. They learned very quickly that their natural effort, combined with the patient's willingness and abilities, meant walking and standing again. They continue to see their patients make remarkable progress beyond anything that anyone thought was possible at the time. The GHS provides them with the tool they need to accomplish a necessary step in the recovery process."

As Cheri goes on to say, "We have been using the Second Step Gait Harness System (GHS) ambulator since late 2005, and we have seen great results with several of our participants (clients).

"Of particular note is the experience of our youngest participant, Knute M., who is now 35 years old. When Knute was 11 years old, he had a traumatic brain injury from a MVA and had never walked after that accident. In February 2006 Knute began walking in the GHS twice a week at Grace Center. This was a "dream come true" for this young man! Knute's recovery was slow, walking only a few feet, but had worked his way up to 150-200 feet by October of 2007, and now routinely walks 400-450 feet in the GHS. He has been focusing on improving his technique in addition to distance, and he can now use the GHS with the assistance of only one staff member who walks behind the ambulator. Knute's posture, balance, and gait have improved greatly with practice and coaching. Staff members encourage him to bring his shoulders backward, "tuck under your buns" (tilt hips & pelvis forward), and take smaller steps. Knute's thigh muscle strength and size have increased so much that he now needs a larger size harness! His home caregiver says that he is much stronger and better able to assist with transfers.

"The Second Step GHS has also allowed several of our other participants who had stopped walking to regain their ambulatory ability. We have found it is especially useful for hemiplegic participants who have very poor balance and are therefore at high risk for falls. The GHS prevents injury not

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only to the participants but also to the staff members who are walking with them. “

Joe Millen PT, MTC, Owner and Founder of Impact Health and Performance, PL of Palm Harbor, Florida, has seen similar outcomes with the GHS as those experienced by Cheri Babb. His facility is focused on the integration of physical therapy principles to make positive changes in the lives of his clients. He has been working with the GHS for over 10 years and has developed a training program for teaching therapist to integrate the GHS into their practice.

Joe continues to experience incredible outcomes, with both higher and lower level clients, in work with the GHS spanning a decade. Joe says, “To me, it’s all about working with the patient to get them standing and back on their feet again. I often say to the therapist, “what if the patient was your family member trying to get back on their feet?” I treat each and every patient the same as I would want to be treated myself, the way I’d want my loved one to be treated. The team effort of using the GHS and functioning together with the patient, works time and time again.”

Joe goes on to say, “Understanding the Gait Harness System and its applications to the life and health of any client is due in part to the fundamental design of the System and then to the application of physical therapy principles and the fundamentals of physiology, biomechanics and neurology. In developing training programs for physical, occupational and recreational therapists, I have focused on the fundamental principles and their applications to the client’s unique issues at the time of each visit, with both short and long term goals in mind.

“My initial experience with the GHS was with 50+ year old woman by the name of Phyllis. Phyllis had suffered a TBI from a motor vehicle accident. It was determined by her therapist and doctor that after months of rehab, she would be bound to spending the rest of her life in the nursing home because she was unable to maintain standing balance. She also had such a significant ataxia that she would literally throw herself laterally. This made using a walker or other device useless for safety reasons, and placed excessive stress on the physical therapist and aides attempting to ambulate her.

“On behalf of Second Step, I was asked to evaluate Phyllis and see if she was a candidate for the Second Step GHS. Our initial contact was profound. After a brief orthopedic and neurological assessment, I placed Phyllis in the GHS and with moderate assistance, got her properly secured. She had an immediate smile as she recognized she was standing on her own without anyone supporting her-- one of the simple

pleasures I’m able to experience in my work. She then proceeded to take very antalgic steps toward the door and we walked out into the hallway with me controlling her lateral movements through the GHS. She walked approximately 100 feet the first session, then sat and rested in the Harness System. She rested for about 90 seconds and we were on our way, moving rapidly down the hallway.

“Our therapy involved providing resistance through the GHS in order to develop motor recruitment and control. She responded very well to standing activities with squatting and single leg stance activities. We played catch with a ball and performed other activities all with the intent to stimulate her neuromuscular system and musculoskeletal system in a positive way. We left the GHS with the nursing home. In three weeks, Phyllis had responded so well she was discharged from the nursing home back to the independence of her home.

“Another early experience with the GHS occurred with a patient of mine, Norman, who had suffered an incomplete spinal injury five years previous to seeing me. He was wheelchair bound, but did have gait orthosis for transfer purposes.

“Norman was at risk of losing his legs due to lower extremity complications secondary to disuse. We got Norman in the Second Step GHS the first day he was in the clinic, using his gait orthosis, and he walked for 15 minutes! This was the first time he had walked for any distance since his injury five years previously. Within 2 weeks Norman was walking for 45 minutes forward, laterally and backwards with standby assist. His legs developed some strength; however, the most significant changes came in the form of increased circulation, bone density and increases in skin temperature and integrity. These changes in his legs were substantial, but just as amazing and maybe more important, all of his cardiac risk factors were improved significantly and he was able to reduce the amount and eliminate some of the medications he was taking for his blood pressure and cholesterol.

“Via his worker’s compensation claim, Norman received a Second Step GHS for his home, continued to do well, and was able to stop his legs from being amputated.

“These early experiences helped to form a foundation for training clinicians how to maximize the therapeutic and life benefits for clients. The essence is to maintain a fundamental and principles based approach to the individual and recognize that we are treating and assisting an entire person, not a body part, a dysfunction, or a diagnosis. Protocols help to give us options to consider but should be based on physiologic or

biomechanical markers. A predetermined program doesn’t account for the enormous possibilities that need to be considered on each and every treatment session.

“The Second Step GHS allows for a creative, responsive and innovative approach that considers the many physiologic, biomechanical, biochemical factors as well as the individual’s opinions, emotional and spiritual needs. I have designed programs for couples to dance, families to exercise and play together and for individuals to do sport specific training. The GHS simply allows for a safe environment for individuals to perform a higher level of functional and movement skills that they could not perform safely or at all. The GHS is a necessary tool to facilitate an aggressive but controlled approach to stimulating the neuromuscular, cardiovascular,



and musculoskeletal systems. It also provides a chance for individuals with a variety of neurologic and musculoskeletal injuries to restore a sense of independence and normalcy to their lives. It requires an applied physiology and applied biomechanics mind set from a clinician (because there are so many the options available to them) but it can be as simple as standing and walking.

“From my 10 years of using the GHS, it is clear it is a fundamental tool that should be used in any facility or home where clients have need of a safe environment for standing, walking or performing other functional activities. The safety of the GHS system benefits patients, family, facility and insurance program alike.”

Bill Thornton, MPT, is the Lead Physical Therapist with the Center for Spinal Cord Injury Recovery (CSCIR). The CSCIR is part of the

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Detroit Medical Center and more specifically, the Rehabilitation Institute of Michigan.

Bill has actively used the GHS for five years. He says, "I need to use it as a critically necessary step with the patient's recovery process. I first experienced Second Step's GHS when I was assigned to clinical research for Dr. Thomas Birk, who is a leading researcher for gait, balance, and exercise physiology. I remember the day when Dr. Birk said "I have a new piece of equipment you can try if you will assemble it for me." I took the Second Step GHS out of its box and have used it ever since. I see it not only as a necessary tool to provide reinforcement of newly learned patterns, but as a major component for environmental enrichment. It puts patients and their families back into a real world environment. I can take the patient outside in the sun. They are able to stand and walk for the first time more independently in virtually any environment. You can imagine how this feels for them and their loved ones."

Bill goes on to say, "The System has allowed our program to be very challenging, efficient, and safe at the same time. Many of the higher level activities would require two or three FTE if it were not for the GHS. I cannot say enough about the ease of use and its psychological benefit of reducing the fear of falling.

"I use the Gait Harness System daily with almost all of my patients. I have had great success using the system for static/dynamic balance activities, trunk strength/coordination, and pre-gait/gait activities (this is done with tetraplegics and paraplegics of all levels). The unique harness is extremely comfortable, works very well with braces, and reduces the number of seated rest breaks with any standing activity.

"The harness has an ability to transfer a variety of individuals (obese, tall...) without compromising skin integrity. I can personally attest to skin tears (acute and in-patient). The harness allows therapists to safely transfer their patients from a bed to a wheelchair (that alone can be a daunting task in an acute setting). The GHS as a whole allows for a therapist to efficiently address the needs of patient from the acute to chronic setting. I see an undeniable need for this piece of equipment and a recovery focused ideology to be implemented throughout a patient's continuum of care."

It is Bill's position that the GHS clearly provides the patient and the caregiver the necessary tool they need in their recovery process.

Having a willing caregiver who wants to see the patient stand and walk, a clinic that shares the

philosophy, a patient willing and able to do the work, together make for a winning combination that is hard to beat. Patients, their family, clinicians and facility administrators are experiencing the value.

Much clinical research has been published which supports this new approach (see Brown, Tracy et al. *Body Weight-Supported Treadmill Training Versus Conventional Gait Training for People With Chronic Traumatic Brain Injury*. *Journal of Head Trauma Rehabilitation*. September-October 2005; Krakauer, John et al. *Generalization of Motor Learning Depends on the History of Prior Action*. *PLoS Biology*. October 2006; Ploughman, Michelle et al. *Exercise intensity influences the temporal profile of growth factors involved in neuronal plasticity following focal ischemia*. *Science Direct*. February 2007; Ferris, Lee et al. *The Effect of Acute Exercise on Serum Brain-Derived Neurotrophic Factor Levels and Cognitive Function*. *Official Journal of the American College of Sports Medicine*. 2007; Matjacic, Zlatko et al. *Methods for Dynamic Balance Training During Standing and Stepping*. *Artificial Organs*. 2005; Whiteneck, Gale et al. *Environmental Factors and Their Role in Participation and Life Satisfaction After Spinal Cord Injury*. *Arch Physical Medical Rehab Vol 85*. November 2004; Behrman, Andrea et al. *Neuroplasticity After Spinal Cord Injury and Training: An Emerging Paradigm Shift in*



*Rehabilitation and Walking Recovery*. *Physical Therapy Journal*. October 2006; Ferris, Daniel et al. *Moving the Arms to Activate the Legs*. *Official Journal of the American College of Sports Medicine*. 2006; Kline, Anthony et al. *Acute treatment with the 5-HT1a receptor agonist 8-OH-DPAT and chronic environmental enrichment confer neurobehavioral benefit after experimental*

*brain trauma*. *Science Direct*. 2007.).

The research began nearly 15 years ago and is now gaining much acceptance as it relates to parts of the brain and the ability to re-pattern itself through this type of therapy. We believe that a patient in the GHS is facilitating needed repetitive movement in a very unique way. This carefully orchestrated, repetitive movement is required by the patient for their brain to rewire, or reconnect, to their feet.

The emerging need to find ways to get functional outcomes for returning war veterans at VA facilities is increasing. As a result of a networking referral from BIAOR's fall conference, the Palo Alto VA Poly Trauma Center obtained GHS's for their TBI and SCI clinics, which are treating returning veterans.

The Palo Alto VA Poly Trauma Center is using their Gait Harness Systems as providing another way to work with their incoming returning war veterans and their families. The many thousands in this population will benefit largely by having this System available.

Debbie Pitsch, PT, at the Palo Alto VA, is already seeing a difference with some of her more challenging TBI patient population. She says, "Although I have limited experience with the GHS (2 patients), I have experienced positive outcomes with using the device with the TBI population. The device allows for early gait training which helped both patients feel successful in working towards their goals of independent ambulation. The GHS is a safe way to work on motor control/motor learning while the therapist can focus on facilitating a more normal gait cycle. I have also found the GHS promotes a faster gait velocity which is difficult to obtain with over the ground ambulation (without the use of a treadmill).

"The benefits I have noticed are the following:

- comfortable harness that the patient can take sitting rest breaks in
- safe way to provide early gait training
- allows the therapist to focus on facilitation techniques vs. holding a patient upright
- encourages independence
- can be used outdoors to help people psychologically
- can ambulate further distances and work on endurance (less therapist fatigue)
- can be used to perform sporting activities to work on balance/strength

Debbie goes on to say, "Many brain injured patients have poor insight and are impulsive, therefore the GHS would be a good option for a

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patient at high risk for falls to walk safely with trained family/staff members. I can also see the potential benefits of using the GHS with amputee patients who are fearful of falling and can promote less dependence on the parallel bars.

"The most commonly reported goal that patients report is to be able to walk again and the GHS allows for early gait training in a safe environment to progress patients quickly out of the parallel bars and improve overall endurance. I would also recommend a trial with the GHS to work on balance training if a patient is having frequent falls at home.

Debbie closes with the thought that "In general, I do not have enough experience to comment on the area of psychological benefits with our active duty/veteran population, but the GHS may reduce anxiety/fear of falling and improve motivation."

In summary, health care systems can be slow and are resistant to change and the idea of hope. I often hear the term 'false hope' used by numerous physicians/clinicians. I see no difference in false hope and no hope.

The various definitions and degrees of neurological recovery are contingent on a number of key factors. Intense and efficient recovery focused rehabilitation is a major one. The GHS is a necessary tool to help those willing and able to do the work and learn to walk again, and maximize recovery.

It's exciting to share this information with those out there so that families may have a possible way to help their loved one regain function, like the many clients we are seeing able to walk again. I hope this is an option for all those living with TBI who can benefit from therapy with the GHS. Thanks to the Brain Injury Association of Oregon for their encouragement and support, and for helping us get this message to you.

If you have any questions about the Second Step Gait Harness System, please contact us at Second Step, Inc., 1625 Hamlet Lane, Eugene OR 97402-7540, T: 541.337.5790, F: 541.689.3202, [secondstep@aol.com](mailto:secondstep@aol.com), and visit our website at [www.secondstepinc.com](http://www.secondstepinc.com).

## Participants Needed for a Study Investigating Memory Difficulties

The Washington State University Department of Psychology is conducting a study on the nature of chronic difficulties that often persist after a traumatic brain injury (TBI). The study will examine individuals between the ages of 18-45 who have sustained a moderate or severe TBI resulting from a motor vehicle, motorcycle, or bicycle accident, or as the result of a fall from greater than 10 feet. To understand the chronic nature of these problems, the study will examine only those individuals who are more than one year post-injury. As a comparison group, the study will also look at neurologically healthy adults who have no significant history of brain injury, neurological diseases, or psychiatric disorders. Participants will be asked to complete tasks designed to assess various aspects of cognition (e.g., attention and memory). As compensation, participants will receive a brief report on their current cognitive functioning, which can help with understanding which functions remain intact and which continue to present difficulties. Participants will also be entered into a drawing to win a \$100.00 prize at the end of the study. Researchers are hoping that examining the nature of persistent memory difficulties will help clinicians in developing more effective rehabilitation and remediation techniques for individuals who have suffered a TBI.

For information on participation, contact Shital Pavawalla, M.S. at [spavawalla@wsu.edu](mailto:spavawalla@wsu.edu) or (509) 432-6172. A message for the WSU TBI research program can also be left at (360) 546-9788, ext. 5-4033. This project has been approved by the WSU IRB.

## Imagine What Your Gift Can Do.

The most important achievements often start where they are least expected. That's why BIAOR is the perfect place to give. It allows your money to go where it's needed most, when it's needed most. BIAOR provides information about brain injury, resources and services, awareness and prevention education, advocacy, support groups, and conferences and meetings throughout the state for professionals, survivors and family members. Your gift makes a difference at BIAOR.

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