

INSIDE MossRehab



Q&A: Innovations in Patient Safety

Alberto Esquenazi, MD
Chief Medical Officer, MossRehab

CHAIRMAN'S MESSAGE

In this issue, you will learn about MossRehab's patient safety initiatives and their importance as part of our patient care. Utilizing evidence-based initiatives to reduce hospital-acquired infections, falls, pressure sores and unplanned transfers to acute care are critical processes that we take very seriously.

Last year we implemented MEWSRehab (modified medical early warning system) to detect physiological and cognitive changes in our patients at the earliest opportunity to prevent unplanned transfers with a significant rate reduction. We also implemented a C-Diff and catheter associated urinary tract infection unit-based protocol with impressive results.

(continued on the next page)

MossRehab is proud to be a leader when it comes to designing and implementing novel initiatives aimed at improving patient safety and outcomes during rehabilitation. Recently, Jerry Zuckerman, MD, chief quality and patient safety officer at MossRehab's parent, Einstein Healthcare Network, sat down to discuss current collaborative efforts geared toward providing exceptional quality and safe patient care across the Einstein Healthcare Network.

MossRehab's dedication to safety is part of a broader mission to improve safety and patient outcomes at Einstein Health Network. And, in turn, efforts at Einstein are part of a nationwide quality improvement program. Could you talk a little about recent national efforts to improve hospital safety?

Dr. Zuckerman: At the end of 2014 the Secretary of Health and Human Services (HHS), Sylvia Burwell, announced a new report on hospital safety called "Safety Across the Board" which now serves as a guide for helping healthcare organizations develop systematic approaches to safety. This guide was prepared by 26 Hospital Engagement Networks (HENs) across the country, all of which are part of a national program called Partnership for Patients. The Einstein Health Network is a member of the Hospital & Healthsystem Association of Pennsylvania, which is one of the 26 HENs.

We have carefully reviewed this report as part of our response to a national call to improve safety, and we have worked hard to refine many of its guiding principles to better fit our needs. We have created an internal Safety Score. The Safety Score reflects a composite of events experienced by our patients while under our care. These events include hospital acquired infections, hospital acquired conditions, readmissions and/or unplanned transfers and medication events.

In the guide to Safety Across the Board there seems to be a greater emphasis on system-wide approaches to safety, rather than on individual unit-based projects. Is Einstein making a shift to "systems" thinking?

Dr. Zuckerman: Our approach to safety at Einstein has always been twofold. We have system- level teams that identify new opportunities for improving safety across our network. These teams examine best practices at other large healthcare organizations and compare those with our practices. By performing a gap analysis we can identify on a systems level, opportunities for improvement.

(continued on the next page)

Inside This Issue

Robotics Collection Expands	4
Mental Health Clinic	6
Investigating Stem Cells	8
Locomotor Training	9
Alumni Profile	10
Latest Research	11

(continued from page 1)

But working with complex medical conditions and high rehabilitation needs makes it even more important that we make the patient environment as safe as possible. To achieve this during the rehabilitation processes, we have implemented new technological solutions to reduce the risk of falls and injury to patients and staff. The Andago from Hocoma and the SafeGait ambulation support and fall prevention devices are just some of the latest robotics we have deployed in our inpatient and outpatient areas.

Read on to learn about our unique Neuro Mental Health Clinic and our integrated locomotor training program, which takes advantage of our clinical strengths and wide array of robotic technologies. We also are participating in research to evaluate the use of stem cells as an intervention to enhance neurological recovery after stroke and traumatic brain injury.

We're proud of alumnus Elissa Charbonneau, who is now chief medical officer for HealthSouth, and the new publications that our experienced and devoted team of researchers and clinicians has produced over the last few months. You can read about them inside, as well.

As in the past, I remain available to facilitate exploring more of what MossRehab brings to the rehabilitation community we serve.

Enjoy

(continued from page 1)

We also focus on safety at the departmental and unit-based level. The Safety Scorecard allows us to view our safety practices within various departments—such as surgery, medicine and rehabilitation, for example—and examine events that are occurring on individual units. Events that occur on a given unit may be specific or unique for that patient population and require more local interventions. For instance, the risk of falls may be higher on a rehabilitation unit than on a non-rehab unit. Therefore, to improve patient outcomes for that rehabilitation unit, it would make sense to focus efforts and resources on preventing falls—even if system-wide more units are making the prevention of bloodstream infections a priority. Indeed, safety experts at MossRehab recently launched a successful initiative to reduce the number of falls that occur among patients undergoing rehabilitation.

The Safety Across the Board report noted that one of the hallmarks of an exemplary healthcare organization is a “healthy preoccupation with failure.” Can you explain what that means?

Dr. Zuckerman: An organization that has a healthy preoccupation with failure is one that encourages the full disclosure of all safety-related events, including near misses. We encourage this type of reporting at Einstein. We understand the value that reporting plays in helping us to better understand our processes and how we can improve them to ensure that care is provided in a safe fashion.

We also understand the importance of making reporting non-punitive; everyone is encouraged to identify potential safety-related problems. Staff members also have the option of providing information anonymously.

The Safety Scorecard, I believe, has increased awareness about patient safety and paradoxically we have seen an increase in reporting. It's likely that the same number of events were occurring in the past, but we simply weren't capturing them. However, I am OK with our score getting slightly worse before it gets better. Reporting more events is not a bad thing—it tells me that there is a heightened awareness of potential risks to patients, and that will help us establish a solid foundation from which we can move forward.

In a recent presentation you emphasized the importance of “putting a face” on the measurement of safety, or safety metrics. Can you explain what that means?

Dr. Zuckerman: I think our staff frequently struggle with statistics and rates related to safety. For example, what does it mean to a staff member when he or she hears that our organization has 0.4 infections per one thousand catheter days? That kind of information is too abstract—it is a number that lacks significance for our staff. Therefore, on the Safety Scorecard we also portray the actual number of patients who experience events. It is far more meaningful for a unit, for example, if we can say that six patients on their unit experienced a particular event. Putting a face on safety-related events makes them more tangible, and it reminds us that someone is at the receiving end of any potential harm event.



Caption caption caption caption caption caption caption caption caption caption caption caption

How does MossRehab interact with the rest of the Einstein Healthcare Network when it comes to issues involving safety?

Dr. Zuckerman: MossRehab is on our network quality dashboard and there are several metrics on which MossRehab and all other members of our network report. These include improving the Safety Score, reducing unplanned readmissions and/or unplanned transfers, and improving the patient experience. The leadership at MossRehab serve as members of our Board Quality Committee as well as our Performance Improvement Committee, and our Patient Safety Committee. Each component of our network tries to learn from the others. Even though the patient populations vary considerably, there are many times when it is possible to learn from a project developed specifically for one unit or facility and apply that knowledge to other areas of the organization, and thereby avoid recreating the wheel.

Have divisions of MossRehab in some cases piloted successful safety initiatives that were later rolled to other parts of the Einstein Healthcare Network?

Dr. Zuckerman: Divisions of MossRehab have led a number of unique and successful safety initiatives. Most recently they developed a strategy for helping to prevent transmission of C. difficile, a serious bacterial infection, which involved bundling together instruments, including a dedicated thermometer, stethoscope and blood pressure cuff, to be used for individual patients with this infection. This strategy helps to ensure providers have equipment necessary to evaluate patients at the point of care and reduces the risk of transporting a potentially contaminated device into another patient's room. It is one that we are trying to reproduce at our main campus and other sites.

They also developed a pressure ulcer prevention program that has proven to be enormously successful. Prompted by a change in mandatory reporting in 2012, MossRehab worked to ensure that its accuracy in the clinical assessment and reporting of pressure ulcers exceeded new expectations by the Centers for Medicare and Medicaid Services. They began to report both mandatory and voluntary information, and heightened communication among physicians, nurses, team leaders and data collectors at MossRehab. After implementing new processes they were able to reduce their healthcare hospital acquired pressure ulcers (HAPU) rate by 66 percent during nine quarters of data collection. Safety leaders from MossRehab subsequently presented this project so that other facilities in our network could learn from their success and determine potential next steps of dissemination. Several remarkable efforts were launched in a single division of MossRehab and then successfully rolled out to its other divisions.

Could you mention an example?

Dr. Zuckerman: MossRehab has developed a number of unique evidence-based safety projects similar to the pressure ulcer prevention program. One of their earliest initiatives was a successful catheter-associated urinary tract infection (CAUTI) program, which involved investigating and analyzing catheter-associated urinary tract infections with the goal of dramatically reducing infection rates and eventually preventing the infections. After the implementation of this program by their UTI team in 2009, MossRehab succeeded in reducing infections by more than 50 percent in the first year. This program was initially piloted in the spinal cord injury units but has since been rolled out to all six inpatient locations and satellite units served by MossRehab.

Could you talk a little about the CUSP program at Moss Rehab?

Dr. Zuckerman: CUSP stands for comprehensive unit-based safety program, and it is a critically acclaimed five-step program developed by the Johns Hopkins Quality and Safety Research Group. In 2014, the stroke rehabilitation unit at MossRehab became one of the first rehabilitation units in the U.S. to adopt the CUSP program, which uses teamwork and heightened communication to improve the awareness of potential safety problems and leverage a facility's ability to learn from errors. MossRehab tailored the program to meet its unique needs, and their modification of CUSP succeeded in joining executives, physicians and staff in achieving reductions in safety-related errors.

The programs developed by MossRehab clearly reflect high internal safety standards. Does MossRehab also seek external accreditation?

Dr. Zuckerman: Absolutely. Every year since 1969, MossRehab has pursued recognition of its own high standards by seeking CARF (Commission on Accreditation of Rehabilitation Facilities) accreditation. This type of accreditation is really the gold standard in the field of rehabilitation, and MossRehab is CARF-accredited in 15 different areas of rehabilitation service, which is quite an achievement. Throughout the Einstein Healthcare Network, we understand the value of seeking external validation of our own very rigorous internal standards, and we are proud that MossRehab regularly pursues these clearly defined and internationally accepted standards of safety and quality.

Safety leaders at MossRehab, including Director of Quality and Education Julie Hensler-Cullen, RN, and Chief Medical Officer Alberto Esquenazi, MD, set the tone for quality improvement at MossRehab and contribute significantly to the improvement of safety standards at Einstein. When it comes to patient safety across our network, it takes a village to provide the very best to our patients, and we are grateful for opportunities to collaborate with MossRehab.

MossRehab Expands Collection of Rehabilitation Robotics

For more than a decade, MossRehab has taken a leadership role in the U.S. and around the world when it comes to bringing new technology to patients and exploring new ways to meet their unique rehabilitative needs. After leading the way in testing and clinical implementation of a wide range of advanced devices, including the earliest model of ReWalk, robots such as the GEO System and Tyromotion collections, and the AlterG™ Bionic Leg, MossRehab is now home to one of the largest collections of robots and rehabilitative devices in the world including three Lokomats and several Armeos Power and Spring.

During the past several months, MossRehab further expanded its impressive collection with several exciting new acquisitions, including Andago®, an innovative portable device from Hocoma, and SafeGait™, a ceiling-mounted dynamic body-weight support system from Gorbelt Medical.

Patients at MossRehab are the first to benefit from Andago in the USA, a mobile robot that intuitively follows patients movement while enabling them to maintain an optimal upright, hands-free posture during unconstrained gait training. The robot is especially useful for bridging the gap between treadmill-based gait training and level floor walking.

“Andago is intended to provide dynamic support to patients who normally would be at risk for falling, or who previously were not able to maintain stability or have decreased endurance while walking,” says MossRehab Chief Medical Officer Alberto Esquenazi, MD. “With Andago, our patients are now able to walk on a level surface, and are not confined to a treadmill. This is an exciting development because it allows our patients to experience freedom of movement as they navigate a realistic environment.”

Before the arrival of Andago, as many as three therapists were required to support a single patient during a walking exercise, or patients were limited to the use of devices that were attached to a track, which confined their movement. Andago allows patients to feel safe and well supported while they walk in a more natural manner.

“We are currently working with a patient who has an incomplete spinal cord injury, who can walk about 15 feet on his own, using a walker or a pair of crutches,” says Dr. Esquenazi. “He can walk slightly longer distances if a therapist provides assistance when he becomes fatigued, which happens fairly quickly because his endurance and strength are quite limited.

When we gave him the opportunity to work with Andago, he more than quadrupled his walking distance the very first time. Now he is practicing with much more confidence and for much longer periods of time, which is very encouraging. And with Andago, it’s possible to optimize the human resources deployed to achieve this kind of progress.”



The Andago provides dynamic support to patients who normally would be at risk for falling.

In part with information provided from our experience with Andago, other rehabilitation organizations around the world will have access to this innovative device this year, as Hocoma recently announced that Andago has been approved for sale in both U.S. and European markets.

In recent months MossRehab also became one of the first clinical facilities in the U.S. to acquire SafeGait™ a ceiling-mounted, dynamic body-weight support system designed to protect patients from falls as they work to establish a normalized gait during locomotor training.

MossRehab is now home to one of the largest collections of robots and rehabilitative devices in the world.

“SafeGait offers many of the advantages that Andago offers, but while some walking ability is required to use Andago, SafeGait can be used to help patients with more significant limitations as they move from a sitting to a standing position, practice transfers or practice maneuvers with their wheelchairs,” says Dr. Esquenazi. “It is specially designed to control weight support during use to potentially reduce up to 50 percent of a patient’s body weight. We use SafeGait with patients who have profound weakness—for example, patients recovering from a stroke, and consequently may have very little stamina or strength. In the past these patients might have required more time before initiating training and the assistance of several therapists, but when they are using SafeGait, our therapists can start earlier and focus on guiding their movements rather than holding the patient up. So with this device we can offer patients substantially earlier, safer therapy and a greater sense of security, with the use of fewer resources.”

Experts at MossRehab also are testing a novel use of SafeGait by allowing patients to use it while learning to achieve balance on two wheels during wheelchair maneuvers.

“Patients who will be long-time users of wheelchairs need to learn how to negotiate obstacles in the environment, by learning to do what we call ‘wheelies’,” says Dr. Esquenazi. “You learn to do one by essentially doing what your mother told you never to do—leaning backward in your chair until you are balancing on the rear two wheels. Until patients become proficient at this maneuver, they are at risk for falling backward. We’ve found that we can strap a patient’s wheelchair to the SafeGait system and thereby allow patients to practice this movement safely and efficiently, in a manner that allows the patient to be dynamically supported and protected.”

While patients continue to reap benefits from Andago, SafeGait and a wide range of other rehabilitative devices at MossRehab, Dr. Esquenazi and his team of clinicians continue to test and explore novel applications for rehabilitative equipment currently under development.



A MossRehab patient demonstrates the use of SafeGait.

“We are collaborating with a number of manufacturers right now,” says Dr. Esquenazi. “Devices that we are currently excited about include some that integrate virtual reality with training activities, and new types of wearable robots, which are designed so that people can eventually use them at home.”

Q & A: Neuro Mental Health Clinic

In 2012, MossRehab established the Neuro Mental Health Clinic in collaboration with Einstein Healthcare Network's Mental and Behavioral Health Department. It is the first clinic in our region to specifically address patients experiencing cognitive difficulties—such as those involving memory, attention, language comprehension, and executive function—who are also struggling with depression, anxiety, stress or other emotional concerns. Sheryl Berardinelli, PsyD, a neuropsychologist at the Neuro Mental Health Outpatient Clinic, recently discussed this unique service for patients undergoing rehabilitation.



Could you talk a little bit about why this clinic was originally established? What unmet needs did it address?

Dr. Berardinelli: We know that mental health problems in patients with neurological impairments, such as those caused by stroke or traumatic brain injury (TBI), often continue indefinitely and frequently result in increased disability and mortality, greater caregiver burden and greater medical costs. In addition to reducing quality of life, these impairments also can significantly interfere

with progress during physical rehabilitation. Prior to the development of the clinic, we did not have a formal way of addressing the special needs of patients with these problems.

Our Neuro Mental Health Clinic, which was developed with the support of an Albert Einstein Society Innovative Program grant, was the result of planning by John Whyte, MD, PhD, the director of the Moss Rehabilitation Research Institute, and William Shapiro, PsyD, the director of outpatient psychiatry services at Einstein Healthcare Network.

What kinds of patients benefit from the clinic?

Dr. Berardinelli: Patients with neurological impairments who are having difficulty adjusting to changes in their life, level of functioning, or personal relationships following a neurological injury are the best candidates. While we accept a wide range of patients, we also do have exclusion criteria, including individuals with psychosis, long-standing personality disorders or major substance issues, all of whom will require longer-term therapy than we provide. Those with profound cognitive limitations that cannot be compensated for are also not appropriate, nor are those whose primary need is for case management.

How does a patient begin to receive services through the clinic?

Dr. Berardinelli: The initial appointment is an intake where a clinician meets with the patient to obtain clinical information. For patients who are appropriate for the clinic, they will be asked to undergo a brief neuropsychological evaluation to identify specific cognitive limitations that must be taken into consideration when planning their treatment. Modifications to the psychotherapy sessions will be made to facilitate their learning and retention of strategies. The number to call for a referral is 215-456-9850 or fax to 215-456-9442, and specify that you are referring to the Neuro Mental Health Clinic.

Why can't these patients benefit from traditional therapy?

Dr. Berardinelli: Depression and anxiety are common and persistent after many neurologic injuries and diseases. However, these same conditions may result in cognitive impairments that interfere with participation in psychotherapy. Patients may forget the content of their last session by the time they arrive at the next one; they may have difficulty following through on therapy homework; and problems with language comprehension or expression may interfere with making notes or keeping a diary. For example, patients with aphasia can have a particularly difficult time expressing themselves,

and many psychotherapists do not have the training necessary to address the unique problems associated with this disorder. Patients with severe memory problems may not be able to benefit from standard talk therapy because they may not be able to comprehend or retain what is discussed in therapy; frequently they can't move forward because therapy amounts to rehashing the same issues week after week.

At our clinic, we tailor treatment to address the cognitive deficits that may interfere with the patient's ability to effectively engage in psychotherapy. Our individualized treatment involves strategies that aren't typically used or may not be necessary in traditional treatment.

Could you give an example?

Dr. Berardinelli: One of my patients experienced a severe traumatic brain injury that left her in a coma, and her condition was so critical that initially no one thought she would survive. Amazingly, she did survive, and during the early stages of her recovery she began to see a psychiatrist, who referred her to me because of her severe cognitive impairment and depression.

When we first began to work together, the patient would not remember me at all from week to week, or any of the things that we did or talked about. We used a number of strategies to address her severe memory impairment. For example, she and I started by taking a "selfie" of the two of us, in which I was holding a sign that identified me by name. The sign said "I'm Dr. Berardinelli and I'm your psychologist" and she was able to take this photo with her and look at it prior to our next appointment. Next I worked closely with her family, and together we created a memory book for her, which provided her with useful information that she could understand. The patient eventually took selfies with each of her doctors, and all of the therapists with whom she was working, and we included these photos in the memory book. The memory book was helpful in reducing her agitation and anxiety about her medical appointments.

Her memory impairment also interfered with her ability to recognize her own progress. To address this issue, we used videos to help her understand where she had been when we first started and to help her see how far along she had progressed. When she was experiencing low moods, she also would have trouble recalling more positive times, and sometimes a video would help her remember that just the other day she had enjoyed a pleasant visit to a book store or a similar outing.

She also took pictures of coping cards that we generated during our psychotherapy sessions. She would look at these pictures during the week to help her with her depressing thoughts.

As her family members have noted, her progress has been truly remarkable. Now she is in the habit of writing notes for herself, which is a good sign.

Do you frequently involve family members in therapy?

Dr. Berardinelli: Yes, as with most of our clinical programs, we encourage family and caregivers to participate in treatment whenever possible. With our patients' consent we do like to involve at least one family member, whom we consider a partner in therapy. We share various strategies with family members so that exercises can be practiced at home. The more exposure a person has, when it comes to practicing a particular skill, the better his or her retention will be.

Do you meet with other therapists who are involved with a patient's rehabilitation?

Dr. Berardinelli: Absolutely. We do our best to work with all of the other providers on a patient's treatment team. I communicate with psychiatrists at MossRehab's Drucker Brain Injury Center, and with speech therapists, physical therapists and occupational therapists to make sure that the treatment goals for each patient are carefully aligned. This gives us an opportunity to learn whether behavioral or emotional issues may be getting in the way of other rehabilitation therapies—whether a patient is too depressed or tearful, for example, to fully engage in speech therapy exercises. We work as a team to refine treatment strategies.

How long do you typically work with a particular patient?

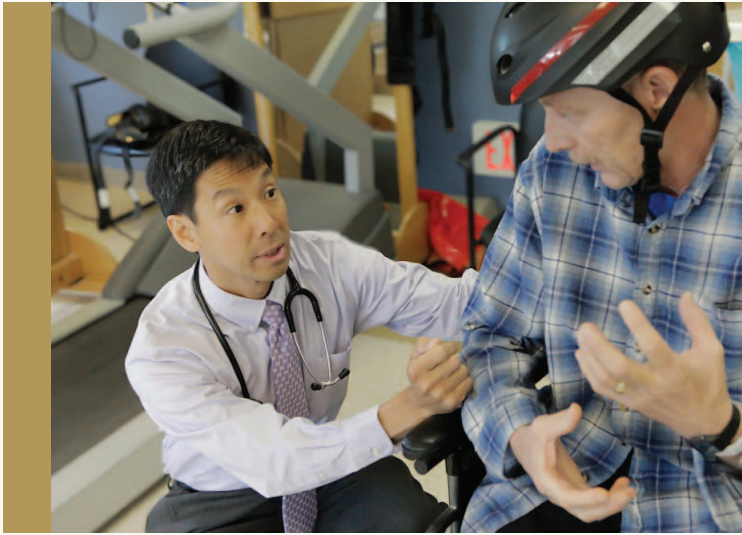
Dr. Berardinelli: The length of treatment is variable. The clinic is designed to provide short-term treatment but the needs of each patient can vary considerably.

Does the clinic have plans to expand the services it provides?

Dr. Berardinelli: Yes, we do plan to expand, and eventually we hope to offer services beyond MossRehab patients but to individuals throughout the Philadelphia region. We already are responding to referrals from a local multiple sclerosis clinic. We are proud to be the only clinic in Philadelphia specifically dedicated to providing psychological and psychiatric treatment for patients with cognitive impairments due to neurologic conditions, and our hope is that we will soon be available for more patients who are in need of our services and to train others.

Investigating the Power of Stem Cells to Heal the Brain

In March 2016, MossRehab began recruiting patients for two unique industry-sponsored clinical trials that will examine the safety and efficacy of using stem cells to help promote motor recovery after stroke and traumatic brain injury (TBI). Only four rehabilitation organizations in the U.S. were selected to take part.



Caption caption

“We are excited that MossRehab was chosen to participate in these studies,” says Thomas Watanabe, MD, clinical director of the Drucker Brain Injury Center and MossRehab’s Stroke and Neurological Diseases Center. “Stem cell-based therapy, which is already playing an integral role in bone marrow transplantation and other treatments, is among the most innovative approaches to potentially enhancing recovery for people who have had strokes and traumatic brain injuries.”

Dr. Watanabe will serve as MossRehab’s principal investigator for these trials, and will head a team that includes co-investigator Michael Marino, MD, an attending physician at MossRehab, and two therapists involved in patient evaluations and a research coordinator. According to the design of the study, patients selected for treatment will undergo stem cell implantation and then come to MossRehab for follow up, which will include ongoing assessments of strength, ambulation and other functional outcomes. Functional brain imaging studies also will be used to evaluate how well patients respond to this intervention.

Restoring function with stem cells

Stem cells are undifferentiated cells that have the potential to develop into many different specialized cell types in the body. Embryonic stem cells, for example, undergo differentiation during the development of a fetus, and eventually become the specialized cells that form the heart, lungs and all other organs of the body. Adult stem cells, such as those in bone marrow, kidneys, or skin are capable of giving rise to new specialized cells as needed during times of growth or repair.

Although patients who undergo bone marrow transplants typically receive stem cells from their own bodies, or from donors, the stem cells that will be used to repair brain injury in these new studies were developed by the study sponsor.

“Historically, it was thought that neurons were not capable of regeneration—that once they were lost, they could not be replaced,” says Dr. Watanabe. “However we now know that there are stem cells in the brain that continue to develop into different types of neuronal cells. For these studies we will be using special adult stem cells, which have undergone testing to make sure that after they are injected into the brain, they will be compatible.”

Introducing new stem cells may help patients recover, in part, by replacing cells that have been damaged by TBI or stroke. After the cells are injected, they will undergo a process of adaptation, during which they may gradually begin to carry on the functions of the cells that were lost due to injury. The donor cells also will likely help repair injured tissue by providing an environment that is more supportive for existing neurons, one that encourages them to engage in repair after injury.

Recruiting patients

“Since March we began recruiting a small number of patients,” says Dr. Watanabe. “Initially we aim to have about six patients in each study, who must meet very detailed inclusion and exclusion criteria.”

Patients from rehabilitation organizations other than MossRehab may be eligible to participate. All patients, between the ages of 18 and 75 years old, must have a neurological motor deficit caused by TBI or stroke. Eligible patients also must be willing to undergo cell implantation and all planned neurological assessments at MossRehab, and must be able and willing to undergo magnetic resonance imaging (MRI) with contrast, and computed tomography (CT). Individuals with certain neurological and systemic diseases, or uncontrolled psychiatric disorders, are not eligible to participate.

Locomotor Training Program Offers Smooth Transition to Outpatient Therapy

In February 2016, MossRehab launched a comprehensive locomotor training program for all patients with spinal cord injury that incorporates innovative technology designed to uniquely complement activity-based therapy. The program will serve to bridge the transition between in-patient and out-patient rehabilitation therapy.

“We have long wanted to establish a framework for leveraging all of the wonderful technology that we have here at MossRehab, in a way that might best benefit the patients we serve in our spinal cord injury (SCI) program,” says Wesley Chay, MD, clinical director of MossRehab’s Spinal Cord Injury Rehabilitation program. “Because we provide lifetime follow up for all of our SCI patients, it made sense for us to develop an overarching structure for using all of the treatment modalities at our disposal in one seamless continuum. This program will address the individual needs of patients at all levels of mobility.”

The new program was designed by Dr. Chay; SCI nurse specialist Beth Jacobs, RN, CCM, CRRN; SCI team leader Naomi Greenberg, DPT; SCI senior therapist Janet Parker, MSPT; outpatient supervisor Theresa Toczykowski, MPT; and research consultant Andy Packel, PT, NCS. It was made possible in part by a donation from philanthropists Barbara and David S. Loeb, Jr., long-time supporters of novel initiatives at MossRehab.

“The Loeb’s have been very generous, once again,” says Dr. Chay. “This new donation helped to spur our acquisition of new pieces of equipment that are particularly geared toward use during transitional stages of rehabilitation and mobility, and it helped support all of our efforts to get this program off the ground.”

Measurement and monitoring

The new locomotor training program will feature the use of sophisticated tools for measuring and documenting the progress of each patient, to enable closer and more precise monitoring throughout the continuum of care.

“The framework we have established, and the treatment we are currently providing, is setting the stage for us to engage in more research down the road,” says Jacobs. “We are incorporating the use of evidence based SCI measures as a standard part of our protocol, which for research purposes will help us better gauge measureable functional and quality of life outcomes. The new program will use advanced flow charts, or algorithms, to guide clinicians in making the best treatment decisions for each patient, at each stage of treatment, with the goal of ultimately enabling patients to be as independent and functional as possible.”

Special equipment

While most of the advanced equipment used in the locomotor training program is located at the Elkins Park main campus, a number of satellite clinics are available for higher functioning patients in search of a location that is more convenient, or closer to home. Patients are offered flexible arrangements depending on the level of clinical support, expertise and technology they require.

“Our tailored therapeutic strategies ensure that patients always feel safe, while at the same time they are being challenged to work harder and smarter to achieve their rehabilitation goals,” says Jacobs.

Customized therapy designed to enhance the restoration of movement now involves the use of a wide range of state-of-the-art equipment, including Andago® for balance and over ground gait training, Lokomat®Pro for weight shifting and balance activation, and SafeGait™, a dynamic bodyweight support system that prevents falls and allows free movement during therapy.

“We have received a lot of positive feedback from our patients who have been using SafeGait™,” says Dr. Chay. “When they are just learning to do things for the first time, it’s normal for individuals to have a great deal of anxiety. Previously independent people who were accustomed to walking and doing things for themselves without thought, who are suddenly coping with neurological conditions that result in weakness and sensory loss and loss of balance, can be inclined to avoid new movements. However, SafeGait provides a high degree of safety and protection from falls, which encourages patients to try new activities. Patients consistently report that they feel secure while using this system.”

Dr. Harry Schwartz, clinical director of MossRehab’s spinal cord injury outpatient program, oversees the transition of patients from in-home therapy to outpatient treatment. For qualifying patients, Rewalk is another mobility device available to trial in MossRehab’s outpatient clinic. Its use allows patients to potentially incorporate the use of technology into their every day life through improved mobility in their home and community outside MossRehab’s walls.

“With time and experience this brand new program will continue to expand,” says Dr. Chay. “And thanks to the expertise of our chief medical officer, Dr. Esquenazi, a renowned leader in the area of rehabilitative technology, I am confident that our program will continue to feature pioneering equipment as well as comprehensive strategies for optimally fine-tuning tailored treatment plans at all levels of mobility.”



MossRehab Residency Alumni Elissa Charbonneau, DO

Then: MossRehab/ Temple resident 1989 to 1992
Now: Chief Medical Officer, HealthSouth Corp., Portland, Maine

[Alberto] Esquenazi, while working in his gait lab and with amputee patients, and Dr. Sridhara for teaching me electrodiagnostics. And, I was very lucky to have Dr. Margarita Torres as a role model—someone who was not only a remarkably talented physiatrist but also a woman physician and a mom.”

Dr. Charbonneau recalls that she was particularly impressed by the team-oriented approach at MossRehab.

“We had a great group of residents when I was there, and we would work together as a very cohesive team. I enjoyed the multidisciplinary approach taken during long team meetings devoted to reviewing the progress of various patients,” says Dr. Charbonneau, who was one of three chief residents during her last year at MossRehab.

Thanks in large part to another former MossRehab resident, Michael Totta, MD, Dr. Charbonneau was recruited by the New England Rehabilitation Hospital in picturesque Portland, Maine shortly after she completed her residency. Dr. Totta, who worked at the hospital at the time, lured her to Maine with high praise for the hospital and beautiful photos of lighthouses by the ocean. After the hospital was purchased by HealthSouth, Dr. Charbonneau stayed on and eventually worked as medical director for 14 years. In January, 2015, she was asked to start a new department at HealthSouth as vice president of Medical Services. She was named chief medical officer in July 2015.

Today Dr. Charbonneau oversees the clinical operations of HealthSouth’s 122 inpatient rehabilitation hospitals across the country. Her daily work involves launching and participating in initiatives to improve clinical outcomes, reduce unnecessary readmissions to acute care, and streamline the care of rehabilitation patients across the post-acute care continuum.

“I feel very passionate about the care that we provide to patients in our inpatient rehabilitation hospitals,” says Dr. Charbonneau, “And I feel strongly that it’s important for us to advocate for our patients to ensure that inpatient rehabilitation is an option for appropriate patients, especially after recent changes, which have had an impact on the post-acute care services that Medicare patients are entitled to receive.”

Like leaders at MossRehab, Dr. Charbonneau makes a point of reaching out to politicians and organizational leaders who shape healthcare policies.

“I think it is essential that we have a seat at the table for discussions with the people who are making decisions on behalf of the government,” she says, “to ensure that our patients are able to receive the services that they need to fully recover from their injuries or illnesses.”

Elissa (Lisa) Charbonneau, DO, remembers that she first became interested in the field of rehabilitation as a medical student, while she was undergoing training in a medical-surgical unit.

“I was always curious about my patients’ journeys after they left the medical-surgical unit,” says Dr. Charbonneau. “When I did a few rotations in hospitals that had rehabilitation units, I always liked to visit my patients in rehabilitation. I’d think, for example, about my patient who had recently had a stroke, and I would wonder what his life was going to be like after he left the acute phase of his hospitalization.”

Also drawn to the field of neurology and brain injury in particular, Dr. Charbonneau eventually pursued some elective rotations in rehabilitation medicine. During a rotation at the International Center for the Disabled in New York City, she was encouraged by a physiatrist to continue to explore the field. This mentor was the first physiatrist she had ever met, and she says his enthusiasm for this specialty area of medicine was palpable. After another rotation, at The Rusk Institute of Rehabilitation Medicine in New York, she began researching residency programs with a focus on rehabilitation, and found that she was most drawn to the program at MossRehab.

“I was newly married at the time and wanted to leave New York, but stay on the East Coast.” says Dr. Charbonneau. “MossRehab was very highly rated and of all of the programs very state-of-the-art. Moss was my first choice, so I was very happy when I was accepted to the program.”

Dr. Charbonneau says that she was lucky to have several inspirational role models during her three years of residency, beginning with attending physician Gary Goldberg, MD, whom she first met while she was still interviewing.

“We had a great conversation and really clicked, and he continued to be a mentor throughout my years of residency,” she says. “Other mentors who really stand out in my mind include Dr. Nathaniel Mayer and Dr. John Whyte, who are both very highly regarded experts in the field of brain injury. Both were extremely inspirational and to this day I am still in awe of both of them. I also feel gratitude for what I learned from Dr.

SCHOLARLY UPDATE

Fisk JR, DeMuth S, Campbell J, DiBello T, **Esquenazi A**, Lin RS, Malas B, McGuigan FX, Fise TF. Suggested Guidelines for the Prescription of Orthotic Services, Device Delivery, Education, and Follow-up Care: A Multidisciplinary White Paper. *MILITARY MEDICINE*, 181, 2:1-11-17, 2016

Talaty M, **Esquenazi A**. A Randomized Comparison of the Biomechanical Effect of Two Commercially Available Rocker Bottom Shoes to a Conventional Athletic Shoe During Walking in Healthy Individuals. *J Foot Ankle Surg*. 2016

Brockway JA, St De Lore J, Fann JR, **Hart T**, Hurst S, Fey-Hinckley S, Savage J, Warren M, Bell KR. Telephone-Delivered Problem-Solving Training After Mild Traumatic Brain Injury: Qualitative Analysis of Service Members’ Perceptions. *Rehabil Psychol*. 2016 Jan 21. [Epub ahead of print]

Correia S, Ahern DC, **Rabinowitz AR**, Farrer TJ, Smith Watts AK, Salloway S, Malloy PF, Deoni SC. Lowering the Floor on Trail Making Test Part B: Psychometric Evidence for a New Scoring Metric. *Arch Clin Neuropsychol*. 2015 Nov;30(7):643-56

Hamzey RJ, Kirk EM, **Vasudevan EV**. Gait speed influences aftereffect size following locomotor adaptation, but only in certain environments. *Exp Brain Res*. 2016 Jun;234(6):1479-90

Hart T, Fann JR, Chervoneva I, Juengst SB, Rosenthal JA, Krellman JW, Dreer LE, Kroenke K. Prevalence, Risk Factors, and Correlates of Anxiety at 1 Year After Moderate to Severe Traumatic Brain Injury. *Arch Phys Med Rehabil*. 2016 May;97(5):701-7.

Hart T, Novack TA, Temkin N, Barber J, Dikmen SS, Diaz-Arrastia R, Ricker J, Hesdorffer DC, Jallo J, Hsu NH, Zafonte R. Duration of Posttraumatic Amnesia Predicts Neuropsychological and Global Outcome in Complicated Mild Traumatic Brain Injury. *J Head Trauma Rehabil*. 2015 Jan 29. [Epub ahead of print]

Juengst SB, Adams LM, Bogner JA, Arenth PM, O’Neil-Pirozzi TM, Dreer LE, **Hart T**, Bergquist TF, Bombardier CH, Dijkers MP, Wagner AK. Trajectories of life satisfaction after traumatic brain injury: Influence of life roles, age, cognitive disability, and depressive symptoms. *Rehabil Psychol*. 2015 Nov;60(4):353-64

Kantak SS, Zahedi N, McGrath RL. Task-Dependent Bimanual Coordination After Stroke: Relationship With Sensorimotor Impairments. *Arch Phys Med Rehabil*. 2016 May;97(5)

McGrath RL, Kantak SS. Reduced asymmetry in motor skill learning in left-handed compared to right-handed individuals. *Hum Mov Sci*. 2016 Feb;45:130-41

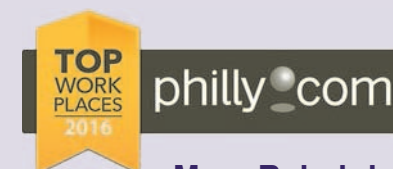
Nozari N, **Mirman D**, Thompson-Schill SL. The ventrolateral prefrontal cortex facilitates processing of sentential context to locate referents. *Brain Lang*. 2016 May 2;157-158:1-13

Peñaloza C, **Mirman D**, Tuomiranta L, Benetello A, Heikius IM, Järvinen S, Majos MC, Cardona P, Juncadella M, Laine M, Martin N, Rodríguez-Fornells A. Novel word acquisition in aphasia: Facing the word-referent ambiguity of natural language learning contexts. *Cortex*. 2016 Mar 19;79:14-31

Pustina D, Coslett HB, Turkeltaub PE, Tustison N, **Schwartz MF**, Avants B. Automated segmentation of chronic stroke lesions using LINDA: Lesion identification with neighborhood data analysis. *Hum Brain Mapp*. 2016 Apr;37(4):1405-21.

Schwartz MF, Middleton EL, Brecher A, Gagliardi M, Garvey K. Does naming accuracy improve through self-monitoring of errors? *Neuropsychologia*. 2016 Apr;84:272-81

Turkstra LS, Norman R, **Whyte J**, Dijkers MP, **Hart T**. Knowing What We’re Doing: Why Specification of Treatment Methods Is Critical for Evidence-Based Practice in Speech-Language Pathology. *Am J Speech Lang Pathol*. 2016 May 4:1-8. doi: 10.1044/2015_AJSLP-15-0060. [Epub ahead of print]



MossRehab has been recognized by the *Philadelphia Inquirer*, *Daily News* and *Philly.com* as one of the Greater Philadelphia Area’s “Top Workplaces” for the sixth year in a row.



Stay on top of the latest. Subscribe to the electronic version of *Inside MossRehab* at mossrehab.com/insidemoss

Inside MossRehab is published by MossRehab, part of Einstein Healthcare Network. Please direct your comments or questions to:

Editor, Inside MossRehab
Einstein Healthcare Network
101 East Olney Avenue
Suite 503
Philadelphia, PA 19120
insidemossrehab@einstein.edu

MossRehab Leadership

Ruth Lefton, FACHE
Chief Operating Officer

Alberto Esquenazi, MD
*John Otto Haas Chair of PM&R
Chief Medical Officer, MossRehab*

John Whyte, MD, PhD
Director, Moss Rehabilitation Research Institute



MossRehab.com
1-800-CALL MOSS



Material in this publication may not be reproduced in whole or in part without permission from MossRehab.