

CASESTUDY

New Technology Enhances Rehab at the Emory Brain Health Center



BIODEX

Biodex Medical Systems, Inc.

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The Emory Brain Health Center in Atlanta is building what it believes will be one of the nation's leading outpatient rehabilitation centers for patients with neurological diseases and conditions. The heart of this modern center on Atlanta, GA's Emory University campus is a team of highly experienced therapists equipped with one of the field's most advanced range-of-technology systems, including the first music therapy-enhanced gait trainer; and the nation's most extensive FreeStep SAS track systems.

The Center brings together more than 400 researchers and clinicians specializing in neurology, psychiatry and behavioral sciences, neurosurgery, rehabilitation medicine, and sleep medicine to more rapidly predict, prevent, treat, or cure devastating diseases or disorders of the brain. Its more than 20 centers and programs include an Epilepsy Center, Pituitary Center, Stroke Center, Treatment Resistant Depression Program, and Veterans Program. The Center's providers, researchers, and scientists work together daily to deliver individualized patient treatment plans for optimal brain and body health. Using advanced technologies and ongoing creative partnerships between specialties, Emory Rehabilitation Hospital – a partnership with Select Medical since 2014 – has proven capable of shortening the lag time between scientific inquiry, discovery, and development of therapies that change patients' lives.

Recently, thanks to a gift from William C. Warren III, the Emory Rehabilitation Outpatient Center in partnership with Select Medical has expanded its technology with two of the latest Biodex Gait Trainers equipped to deliver rhythmic auditory cueing via music therapy integration, a nation-leading Biodex FreeStep SAS supported ambulation system, and a BioStep™ 2 Semi-Recumbent Elliptical cross trainer.

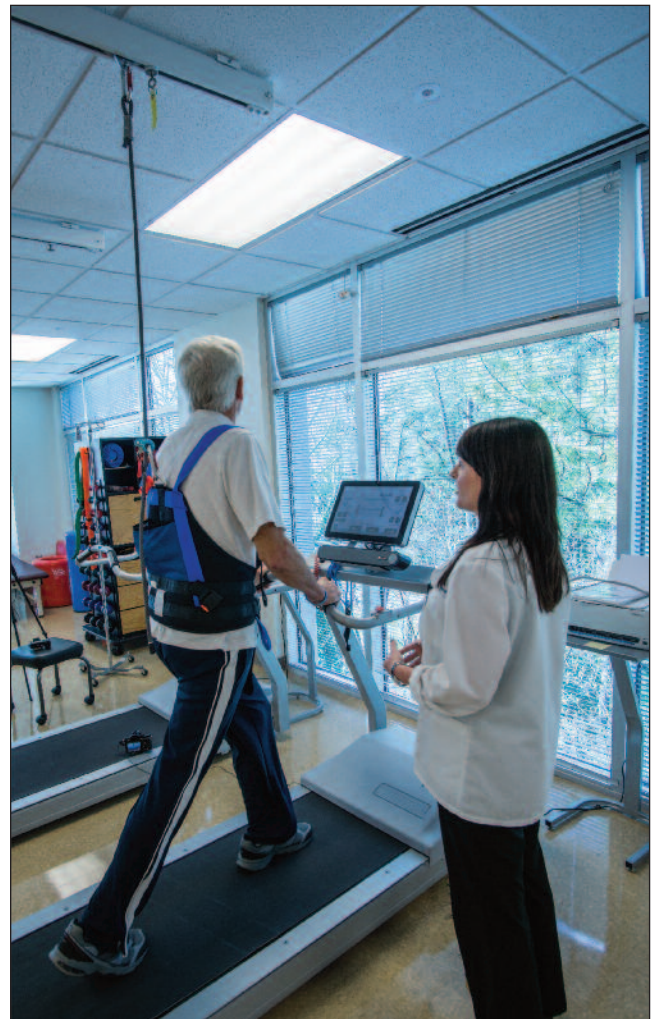
Introducing Emory's Brain Health Outpatient Program



Devra Brown, PT, DPT
Outpatient Manager, Emory
University Rehab Hospital

Devra Brown, PhD, is manager of the outpatient rehab program at Emory Rehabilitation Hospital. She received her physical therapy degree from the Medical College of Georgia, and recently graduated as doctor of physical therapy.

“Our neuro rehab clinic is hospital-based and supports the Emory Rehabilitation Hospital located on our main campus,” Dr. Brown explains.



Protected from falls with the Biodex FreeStep track system, patient Ken McDonald safely trains on one of the clinic's two Biodex Gait Trainers, each equipped with the latest music therapy features proven to enhance rehabilitation of people with Parkinson's disease and other neurologic conditions.

“We are a 3,500 square-foot rehab center with ten therapists, two speech pathologists, two neuro physical therapy residents, and three occupational therapists.”

“We are a 3,500 square-foot rehab center with ten therapists, two speech pathologists, two neuro physical therapy residents, and three occupational therapists. Two of those physical therapists are undergoing one-year neuro residency training through the Emory School of Physical Therapy. Our clinic also collaborates with the faculty in the Emory Physical Therapy Program.”

Patients who come to the Emory clinic span the range of neurologic diseases and disorders including Parkinson's disease, stroke, and traumatic brain injury.

“Those with Parkinson's disease typically present with an inability to navigate their environment with normal movement patterns, due to stiffness, freezing of gait – and highly challenged balance,” Dr. Brown notes. “These symptoms lead them to become sedentary, which – over time – simply reinforces those disabilities.

“Beyond specific therapy and verifying that they take their medications as prescribed, successful therapy includes a significant degree of encouragement to continue recommended exercises between therapy sessions,” she said.

New technology accelerates therapy, protects patients and PTs

The clinic's new systems expand the ability of its therapists to rehabilitate the broad range of patients they see, using the latest therapy-accelerating technology in a staff-efficient and therapist/patient safety environment.

BioStep. Any patient requiring aerobic conditioning – for example, those suffering from stroke, Parkinson's, or traumatic brain injury – is commonly rehabilitated on the clinic's new BioStep Semi-Recumbent Elliptical bike. The BioStep combines components of an exercise bicycle and an elliptical trainer, allowing the patient to benefit from endurance training and aerobic exercise.

FreeStep SAS.

Emory's new FreeStep track system protects patients being treated on the clinic's Gait Trainers from a potential fall and injury, as well as those relearning to ambulate safely over ground. By increasing staff efficiency and reducing risk of their injury, the track system enables the clinic to better meet the challenge of changing reimbursement, since it enables a single therapist to treat each patient, no matter how unstable or obese.

“Most clinics attempt to guard patients at risk of falling while ambulating with a



Therapist Amy Morse exercises a patient with Parkinson's disease as he navigates an obstacle course, assured he cannot fall by the clinic's FreeStep track system that spans virtually every open space, and over all equipment.

therapist and an aide. Such a practice can expose both patient and therapists to risk of injury – and obviously, therapists can't prevent a fall when a patient is on a treadmill,” Dr. Brown explains. “The FreeStep lets a single therapist train even our most unstable or obese patients without risk of injury to either patient or therapists.”

“...the FreeStep track system allows the patient to safely experience changes in balance and to learn how to respond physically to those changes in balance.”

Dr. Brown observes that the clinic's FreeStep track system allows its patients the freedom to move fearlessly all around the clinic – even in its occupational therapy kitchen and laundry.

“In addition to safety, the combination of the FreeStep track system allows the patient to safely experience changes in balance and to learn how to respond physically to those changes in balance. That's critical to patients learning how to safely walk in the community – and can't be learned with aides or parallel bars, as in most clinics.”

Gait Trainer. The Biodex Gait Trainers facilitate rehab of patients who require step length endurance training to better prepare them for safe community ambulation. While looking much like a traditional fitness treadmill, the Gait Trainer has an instrumented deck that issues both audio cueing and visual biofeedback of footfall to a large LCD screen to prompt patients into their correct gait pattern.

A therapist-managed onboard Gait Trainer computer monitors patient step length, step speed, and right-to-left time distribution (step symmetry) in real time, compares it step after step to desired footfall, and displays it on the patient's screen.

“The gait trainer also allows for reverse training, incline training, backwards or forwards,” Dr. Brown said. “We can increase step length and stride length in any of the neurological population.”

Therapists can record each patient's session performance, and print it to demonstrate improvement to managed care companies and Medicare contractors.

“We can combine gait training with the FreeStep harness system to allow patients important freedom of activity and balance,” Dr. Brown notes, “so they learn how to manage potential fall risks in the community.”

New Music-Assisted Therapy for

Parkinson's. The new Gait Trainers recently installed at Emory incorporate rhythmic auditory cueing, a well-researched music therapy technique shown to accelerate gait rehabilitation through neuroplasticity in people whose ability to walk has been compromised by Parkinson's disease, stroke, traumatic brain injury, and cerebral palsy.

Walking can be aligned with musical rhythmic cues to improve step speed, step length, and step symmetry (left/right stride deviations). Taking rhythmical music therapy a step further, the Biodex Gait Trainer integrates music therapist-informed compositions that help to improve the overall quality of movements – encouraging functional gait improvements in postural alignment, hip flexion, torso rotation, and arm swing through specifically chosen musical elements.



Parkinson's patient Ken McDonald rehabilitating on one of the clinic's new music therapy-enabled Gait Trainers under the guidance of therapist Amy Morse.

“Taking rhythmical therapy a step further, the Biodex Gait Trainer integrates music therapy-informed compositions that allow therapists to improve the overall quality of movements...”

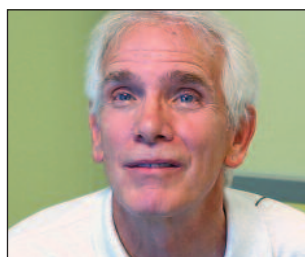
Experienced clinicians capitalize on referring experts, state-of-art systems

The heart of any rehabilitation service is its experienced, specialized staff. Example: Amy Morse is a physical therapist who joined Emory four years ago earning a BS degree in exercise from Elon University and a PT degree from the Medical University of South Carolina. Morse then spent four years at St. Francis Hospital in Greenville, SC. At Emory Healthcare, she specializes in treating people with movement disorders – specifically, those with typical and atypical Parkinson's and Huntington's disease.

“Here at Emory, we have some of the best movement disorder specialist physicians in the country,” Morse explains. “We have access to the latest research here. Our gym is state-of-the-art with amazing equipment that I can use to really challenge my patients. I also have access to PD Gladiators, an Atlanta community-based wellness organization devoted to combating Parkinson's disease with vigorous exercise.”

Ken McDonald: A success example

One of Morse's patients is Ken McDonald, who was diagnosed at 59 with Parkinson's.



Ken McDonald

Before developing Parkinson's disease, McDonald was a human resources manager for a Fortune 500 automotive company with 1,500 employees reporting to him. A year after his diagnosis, four years ago, he retired.

“Parkinson's slowed me down dramatically,” McDonald explains. “I realized I couldn't support my team as I wanted, so I decided to retire.”

As McDonald's therapist, Morse recalls he presented a lot of walking and posture issues.

“He was very forward in his walking and posture, which was leading him to fall a lot,” she explains. “So we really worked on his body awareness and his posture. At first we focused on him standing up straight, feeling his weight shifted back on his heels. From there, we progressed to working on walking and balance.”

According to Morse, McDonald is highly motivated. He exercises religiously at home, and follows his home rehab plan precisely.

McDonald recalls the diagnosis of Parkinson's disease as personally “traumatic.”



The Emory outpatient neurorehabilitation clinic focuses heavily on helping patients with Parkinson’s disease recover their ability to ambulate safely in the community – and thus, has installed one of the world’s most extensive overhead track systems, 220 feet of Biodex FreeStep SAS that enables patients to practice walking and performing occupational therapy in a kitchen or laundry area without risk of a fall.

“You tend to at first go within yourself, avoid people, avoid going out,” McDonald admits. “You don’t want to look not normal. You don’t want people’s pity or sympathy. After you learn to talk better, you feel more comfortable. And yet, you’re never comfortable.”

He goes on, “Your whole life is changed. I exercise about six hours a day. I run. I work in my yard probably eight hours a day, and sleep about six. I don’t usually shake, but when I do, I aggressively attack that or any other problem that arises.”

McDonald credits his therapist for encouraging his rehab efforts.

“Amy is persistent. She doesn’t let you do it wrong. The first thing we do is discuss what I’ve done at home between therapy sessions. How many times have I exercised? How many times have I done the stretching or ‘big,’ walking?”

“Recently I haven’t been seeing Amy because my insurance won’t pay for any more sessions this year, and I can’t afford to pay for it out of pocket. I could feel the difference. The difference is the consistency of doing what she shows you.”

Melinda White: Pedaling to recovery after 15 strokes

Another of Emory’s success stories is Melinda White, a woman who sought therapy at Emory after moving to Rex, Georgia.



Melinda White

Upon arriving at the Emory Brain Health Center, White was assigned to physical therapist Toni Olliff, who has been working at Emory for 40 years, currently in its outpatient neuro clinic.

“A couple of years ago Melinda suffered a series of 15 strokes while living in another state,” therapist Olliff recalls. “She connected with Emory-affiliated physicians who referred her to our outpatient neuro clinic back in February, 2017. The objectives of her therapy are to improve her endurance, balance, and walking skills,” Olliff explains.

The principle system therapist Olliff used in rehabilitating White was the unit’s Biodex BioStep Semi-Recumbent Elliptical bike, which enables a wide range of rehabilitation protocols. The BioStep combines the

progressive resistance of an elliptical with the rotation of a bicycle. Lower extremity exercise with the BioStep is closed-chain activity, which is what her therapists want to increase the strength of her hip stabilizers.

“When she started therapy in February, a BioStep resistance of level 1 challenged her. Two months later, she’s up to a level 4.”

“Ordinarily, we use the BioStep to work both arms and legs in a symmetrical fashion, to build both leg and arm endurance,” Olliff explains. “But in some sessions, we work just legs. To simulate hills, I increase the resistance against which she must pedal. When she started therapy in February, a BioStep resistance of level 1 challenged her. Two months later, she’s up to a level 4. She started out being able to pedal only five minutes, but in two months, she increased to twenty minutes.”



Therapist Toni Olliff monitors multiple-stroke patient Melinda White as she strengthens her arms and legs on the Emory outpatient clinic’s new semi-recumbent elliptical BioStep.

Much of White’s exercise with the BioStep has focused on her legs, when Olliff instructs White to put her arms on her lap.

“As she increased her leg strength and endurance,” Olliff explains, “we added upper extremity exercise with the BioStep as well – and White sees the benefits in her daily life.”

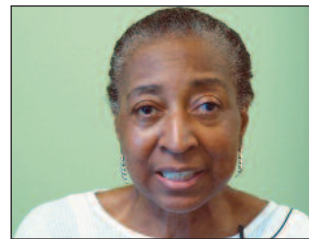
“Since I started coming here my legs have definitely gotten stronger,” White reports. “I’m able to walk up steps better. I’m able to walk without wobbling. I’m walking straighter, my balance is better. I wasn’t using my left hand or my left arm when I came. Now, thanks to occupational therapy here, I’m definitely using my left hand and arm to carry and pick things up.”

White also reports she’s regained ability to control her downhill walking speed – once a source of amusement to her children and husband.

“They used to tease me, ‘There she goes, runaway Lynn!’ because I could not control my legs – my brain was not connecting to tell me to slow down. Now that my legs are stronger, I can take the advice Toni gave me to lean forward when I’m walking up hills and lean backwards when I’m walking down hills and just control myself.

“The BioStep helped me walk better because I was putting most of my weight on my good leg, which made me wobble. Now I’m learning how to again bend my legs and not walk so stiff.”

Dora Brown-Grant: From bedridden to flying again



Dora Brown-Grant

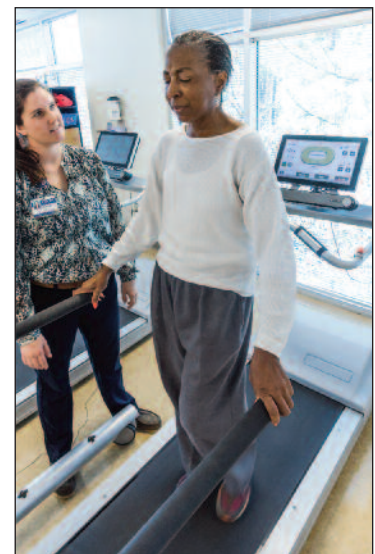
Dora Brown-Grant is a flight attendant recovering from the effects of an autoimmune variant of rhabdomyolysis, possibly an inherited muscle condition that increases the risk of muscle degeneration most commonly seen in people with severe crush

injuries. She was an inpatient at Emory Hospital from mid-November 2016 through the end of January 2017, and upon discharge, started outpatient rehabilitation at the Emory outpatient clinic.

“For rehabilitation of my lower extremity, I spend a lot of my rehab time on the Gait Trainer,” Brown-Grant explains. “I also do endurance walking with force, and to improve balance, walking up and down stairs... a lot of leg extensions, leg lifting with ankle weights and planks.”

Brown-Grant went through similar exercises to build up her upper extremity.

“When I do the treadmill, my therapist Keenan Whitesides and I focus on endurance. I practice walking uphill by incline, and then I turn around and walk backwards. All that’s helping with my balance, and the speed, with endurance. My focus in outpatient therapy has been to build up my endurance – and the Gait Trainer has helped me accomplish that.”



Keenan Whitesides, PT, DPT guides Dora Brown-Grant as she practices backward walking on one of Emory’s new music therapy-enabled Gait Trainers.

Biodex Gait Trainer™ 3 with Music-Assisted Therapy

Music therapist-informed compositions, combined with gait training technology, bring music-based therapy to the plan of care.

Learn more at: www.biodex.com/gait

Biodex FreeStep SAS

Customizable track and harness system that provides safe ambulation and support for weak or balance deficient patients.

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Biodex BioStep™ 2

Combine the benefits of smooth, elliptical cross-training exercise with the comfort, safety and stability of semi-recumbent positioning.

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