

CASESTUDY

# **Biodex Mobility Package with Stride-Stretching Techniques Enhances Gait and Balance for Patients with Parkinson's disease**

**Body In Balance Physical Therapy and Fitness Center**



**BIODEX**

Biodex Medical Systems, Inc.

20 Ramsey Road, Shirley, New York, 11967-4704, Tel: 800-224-6339 (Int'l 631-924-9000), Fax: 631-924-9241, Email: [info@biodex.com](mailto:info@biodex.com), [www.biodex.com](http://www.biodex.com)

Copyright © Biodex Medical Systems, Inc.

## Body in Balance

Body in Balance Physical Therapy and Fitness Center, Linwood, NJ specializes in meeting the rehabilitation needs of area seniors. Physical therapist Eleanor (“Ellie”) Hagan founded the center in 2012 following more than a decade as a therapist and manager in outpatient and home PT services. Body in Balance serves patients of all ages with a broad range of neurologic and orthopedic conditions, although approximately 80% are geriatric.

To treat this spectrum of patients, Body In Balance combines the latest in Biodex rehabilitation technology with specialized therapeutic approaches such as Schroth scoliosis treatment and the Farley “BIG” strategy for Parkinson’s disease. That equipment includes the Biodex

*“I’ve expanded on the BIG principles with my Biodex mobility package, which allows me to safely apply BIG across a wide spectrum of Parkinson’s disease patients.”*

Balance System SD, the Biodex Gait Trainer GT3, the Biodex Unweighing System and the Biodex BioStep 2 Semi-Recumbent Elliptical.

Beyond older individuals with a specific neurologic or orthopedic condition, Body in Balance serves a subset of



When Carmine concentrates on his Biodex BioStep exercises, he says “it feels like I don’t have Parkinson’s. The more I practice, the less I shake.”



Ellie successfully applies the BIG principal; Carmine kicks the ball while utilizing the Biodex Gait Trainer 3, resulting in bigger steps over ground.

very elderly patients seeking to overcome the debilitating effect of generalized aging – those who aspire to regain or retain home and community mobility.

### **Dissatisfaction with traditional PT for Parkinson’s disease patients**

As a therapist who went to people’s homes and as a manager of an outpatient facility, Ms. Hagan says she saw a lot of Parkinson’s patients who weren’t improving much with traditional physical therapy.

“I felt conventional PT simply wasn’t getting them to an optimum state,” Ms. Hagan recalls, “so I began searching for alternate approaches – and discovered Becky Farley’s ‘BIG’ therapeutic strategy, which she developed at the University of Arizona, Tucson.”

BIG capitalizes on observed neuroplasticity benefits of exaggerated movement training in patients with Parkinson’s disease. Dr. Farley’s research, and the clinical experience of therapists she has trained, demonstrates that Parkinson’s disease patients may reduce bradykinesia and hypokinesia and increase their ambulation speed and confidence by training with increased upper and lower limb amplitude.

“I took two courses with Professor Farley, and participated in a one-week workshop on BIG technique,” Ms. Hagan explains. “I’ve expanded on the BIG principles with my Biodex mobility package, which allows me to safely apply BIG across a wide spectrum of Parkinson’s disease patients.”

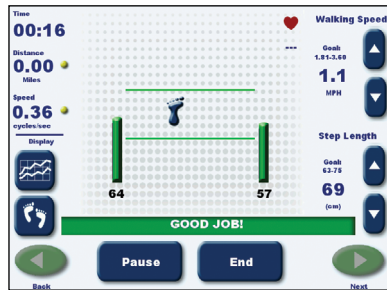
“One of the hallmarks of Parkinson’s disease is a habituated short-step shuffling gait,” Ms. Hagan notes. To correct that gait, which puts patients at increased risk of falls, Ms. Hagan combines her BIG training and her Biodex systems.

*“Research has shown that Parkinson’s disease patients who practice walking backwards with an exaggerated step length have a bigger walk, a more functional walk, a safer walk...”*

“Typically, I start a rehab session with several minutes on my Biodex BioStep Semi-Recumbent Elliptical,” Ms. Hagan explains. “That helps them loosen up, and starts them extending their upper and lower extremities, readying them for work on the Biodex Gait Trainer.”

The Biodex Gait Trainer is a special treadmill with an instrumented track and a large “heads-up” LCD display that issues both audio and visual real-time biofeedback to prompt patients into correct gait pattern. Step length, step speed and right-to-

left time distribution (step symmetry) are displayed versus a desired footfall pattern. After each session, patient performance can be printed out to document improvement to both patients and payers.



Real-time biofeedback on the Biodex Gait Trainer 3 prompts patients into a correct gait pattern.

“The objective of exercise on the Gait Trainer is to encourage Parkinson’s disease patients to take big steps,” Ms. Hagan explains.

“Their idea of a big step is usually a lot smaller than ours. And so, when I put them on the Gait Trainer, I place a large gym ball at the head of the Gait Trainer track. When they’re walking at a comfortable pace, we ask them to take big steps, and to try to kick the ball, first with their left toe, and then with their right: left, right, left – which forces them to take very large steps. Then we ask them to turn and sidestep – to kick that ball with the side of their foot as they take each big step.”

Then Ms. Hagan stops the Gait Trainer and sets it to run in reverse, asking the patient to kick the ball while walking backwards – again, taking big steps.

“Research has shown that Parkinson’s disease patients who practice walking backwards with an exaggerated step length have a bigger walk, a more functional walk, a safer walk, when they’re on solid ground. The ability of the Gait Trainer to run in reverse allows patients to face the LCD display and adjust their gait as they walk both forward and backward.

“In addition, the Gait Trainer has a selectable audio cueing option, which helps some Parkinson’s patients step more regularly, breaking their tendency to take short, shuffling steps.”

**Patient Case: Carmine, 73, with Parkinson’s disease & severe scoliosis**

To illustrate her application of her Biodex technology to BIG therapy, Ms. Hagan points to Carmine, a 73-year-old patient diagnosed three years ago with Parkinson’s disease.



Carmine learns how to correct his center of gravity on the Biodex Balance System SD.

“Carmine obsesses over a significant right-hand tremor, and an anxiety disorder that predates his Parkinson’s diagnosis. When he thinks about and worries about his tremor, his symptoms get much worse. But when he’s concentrating on his exercises and he’s involved with the program, it’s like he doesn’t have Parkinson’s at all.

“I start Carmine’s sessions on the BioStep, which he enjoys, and soon, his tremor largely disappears. I then transition him to the Gait Trainer, and begin a series of stride-lengthening exercises – forward steps kicking the exercise ball, then side-stepping and kicking the ball, then backward walking and kicking the ball.

“Carminé is a little more of a challenge for me, because in addition to Parkinson’s disease, he has severe scoliosis, causing his right lower leg and foot to rotate externally and to shift his weight to the right. His center of gravity is unbalanced to the right. That complicates the normally altered sense of balance in Parkinson’s disease.”

Parkinson’s patients face increased risks of falling due to gait freezing – which can lead to propulsion (forward) falls when their feet “freeze,” because they commonly stand and walk in a forward-stoop position. That same altered sense of balance can lead to retropulsion (backward) falls due to an unrecognized tendency to lean or rock backwards when they stand, or turning, or arising from a seated position.

“I train Carminé on our Biodex Balance System to let him feel what it feels like to weight shift onto that right leg, what it feels like to go up onto his toes and not worry about losing his balance, what it feels like to go onto the heels of his feet and bend his trunk forward, so he knows he’s not going to fall. All those feelings and cues will transfer, hopefully, into better balance in the real world.” How does Carminé feel about his high-tech rehab: Excited and motivated!

“The more exercise you get, the better you’ll be. Since I started exercising, I find that my shaking goes away much of the time, and I feel better about myself. Once I start my session, I feel physically fit, like there’s nothing wrong with me. It’s slowing down the (disease) process – it’s helping me tremendously.”



Eleanor Hagan, PT and Founder of Body in Balance Physical Therapy and Fitness Center, Linwood, NJ.

---

Biodex is always advancing our technology to serve you better.

**Balance System™ SD**  
[www.biodex.com/balance](http://www.biodex.com/balance)

**Gait Trainer™ 3**  
[www.biodex.com/gait](http://www.biodex.com/gait)

**NxStep™ Unweighing System**  
[www.biodex.com/nxstep](http://www.biodex.com/nxstep)

**BioStep™ 2**  
[www.biodex.com/biostep](http://www.biodex.com/biostep)

For more information on Biodex Physical Medicine & Rehabilitation devices:

(800) 224-6339  
[info@biodex.com](mailto:info@biodex.com)

**BIODEX**  
Biodex Medical Systems, Inc.

20 Ramsey Road, Shirley, New York, 11967-4704, Tel: 800-224-6339 (Int'l 631-924-9000), Fax: 631-924-9241, Email: [info@biodex.com](mailto:info@biodex.com), [www.biodex.com](http://www.biodex.com)