

Biodex Mobility Systems for Patients with Dementia

Lighthouse at Waconia



BIODEX
Biodex Medical Systems, Inc.

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Many assisted living facilities across the nation are investing in the latest Biodex mobility rehabilitation systems, to enable their physical therapists to deliver the most advanced forms of exercise to their residents.

At five of 12 senior care facilities in Minnesota, Wisconsin and Illinois, operated by New Perspective Senior Living, residents with dementia can be rehabilitated with the latest Biodex mobility-rehabilitation systems, including:

- The Biodex Balance System SD, to help balance-challenged seniors recover the ability to properly weight-shift
- The Biodex Gait Trainer 3, a specially instrumented treadmill that helps gait-impaired elderly learn how to step appropriately and evenly
- The Biodex BioStep Semi-Recumbent Elliptical trainer, on which even wheelchair-confined residents can exercise as part of a comprehensive rehab program

In addition, some Lighthouse facilities have the Biodex FreeStep SAS overhead safety systems and the Biodex Upper Body Cycle. All the Biodex systems enable Lighthouse-based physical and occupational therapists to provide state-of-the-art rehabilitation services to residents recovering from stroke, hip and knee replacements, or fighting the effects of progressive conditions such as Parkinson's disease and Alzheimer's disease.

Lighthouse of Waconia uses Biodex systems to rehab residents with mild, moderate dementia

At the Lighthouse of Waconia (MN), Meghan Klein, DPT, manages the Odom Health & Wellness center, and explains how she and her fellow therapists rehabilitate residents with her complete range of Biodex mobility systems.

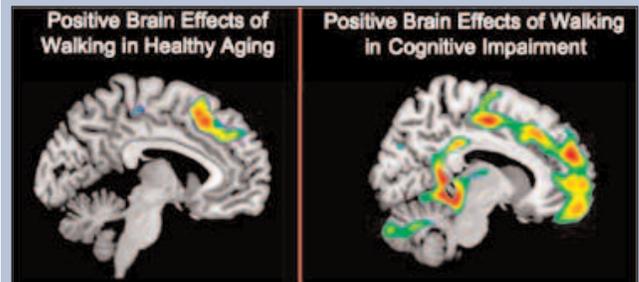


Even patients with moderately-severe dementias can understand and benefit from the Biodex Balance System – the games and techniques are simple enough.

Clinical studies at facilities around the world are accumulating a growing body of evidence supporting the intuitive beliefs of many physical therapists that a structured exercise and balance development program offers a variety of important benefits to individuals with mild and moderate Alzheimer's disease.

The most convincing evidence that exercise might modify Alzheimer's disease risk were presented by a University of Pittsburgh team at the 2010 meeting of the Radiological Society of North America. The Pittsburgh team analyzed the relationship between physical activity and brain structure in 426 seniors monitored over a 10-year period. Of the 426 who began the study, 299 entered without cognitive impairment, 83 had mild cognitive impairment and 44 were diagnosed with Alzheimer's dementia.

Among seniors who began the study as normal and eventually developed Alzheimer's and mild cognitive impairment, those who walked 5 miles per week displayed MRI evidence of brain-volume preservation comparable to those who ended the study as normal. They had a better preservation of the hippocampus, frontal and temporal lobes, and showed apparently compensatory brain activity in brain regions most associated with the debilitating effects of Alzheimer's disease.



More important, those who walked 5 miles per week displayed longitudinal mini-mental state exam (MMSE) results that declined only one point over 10 years. By contrast, sedentary trial participants who developed Alzheimer's disease displayed a 5-point decline in MMSE scores over 10 years.

“We use the Biodex Balance System with a number of different types of patients,” Ms. Klein explains. “Surprisingly, we have been able to use it with dementia patients a lot, most of whom have balance issues.”

The Balance System makes rehabilitation enjoyable for Lighthouse residents, Ms. Klein reports. She claims that its games and training techniques are usually simple enough for even residents with moderately-severe dementias to understand. Unstable residents can perform them while supported in the Biodex FreeStep track and harness, so that they and PTs need not fear a fall.



Biodex Balance System SD helps balance-challenged seniors recover the ability to properly weight shift.

“A lot of times, it is difficult for a dementia patient to follow multiple directions, but with the Biodex systems, they are usually able to follow directions well enough to complete a task. They are also willing to chance getting their center of gravity in different positions outside their sway envelope, which they are not typically used to doing.”

As an example, Ms. Klein points to Jean, a resident with early-onset dementia. In a casual conversation, she notes, you might not detect Jean’s processing issues, but as you work with her, you definitely notice her deficits.

“Jean came to us with knee pain due to patella femoral tracking problems,” Ms. Klein explains, “so she had weak quads and poor general control of her knee. We have been trying to strengthen her hips, quads, and hamstrings so that she keeps better knee alignment. By working up the entire chain, we can try to keep her whole joint stable, to help prevent pain from arthritis as well.”

Because Jean doesn’t trust her balance, the Odom PT team works with Jean to improve her balance and confidence.

“Before we obtained the Biodex Balance System, we provided Jean with a lot of pool therapy and gym exercises. Once we started using the Balance System SD, we saw the positive effects of giving her more feedback so that she could learn to trust herself better than she normally would.



The effects of positive feedback improves both balance and confidence.

“A lot of times, falls result just from patients being too fearful to try things. And so, pushing Jean’s comfort level improved her balance overall. With the Balance System, we are able to challenge her with exercises like standing on one leg or doing squats, and reaching out beyond her limits of stability. Not only are we challenging her balance, but we are also working on her ability to follow multiple-step directions, so that as she does one component of the task, she has to remember the next component of the task, as well.”

As Lighthouse residents perform the programmed exercises embedded in the Biodex Balance System, they can see the effect of each weight shift on a large LCD touch screen. The Balance System stores prior session exercises, and enables output reports of repeated session performance, documenting improvement for reports to private payers and Medicare. Similar documentation is generated by each resident’s sessions on the Biodex Gait Trainer.



Performance screens and printable reports demonstrate patient progress and proves need for continued therapy.

“For example, with Jean, we can use a lot of different, fancy rehab techniques with the Gait Trainer,” Ms. Klein said. “We can do sideways walking up a hill, and that helps strengthen her hip adductors, in particular. They get real sore real fast, and so we are just trying to strengthen the chain.



To strengthen hip adductors, Dr. Klein has her patient walking sideways, uphill, on the Biodex Gait Trainer 3.

“Another thing – Jean's coordination is a bit off, so the fact that we can challenge her walking up a hill is something that we could not do on a level surface. We can also do backwards walking with her, which is another way we work on coordination and strengthening at the same time.

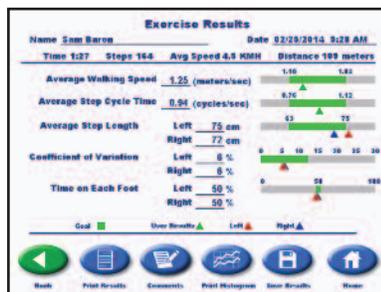
“Jean is in pretty good physical condition overall, so the treadmill gives us effectively unlimited walking space, so she can go for as long as she can tolerate, whereas otherwise, we would be doing laps around the facility.

FreeStep SAS track and harness system and Gait Trainer 3 safely exercise advanced dementia residents

While Jean displays only mild, early signs of dementia, the PT team at the Lighthouse of Waconia routinely uses its Biodex systems on residents with more advanced mental issues.

“Al is an elderly patient in his 90s, and he has pretty significant dementia,” Ms. Klein recalls. “We like to use the FreeStep harness system with him, as he can be impulsive with his movements; he will stand up or sit down when we are not ready for it, so the harness is just a second hand to make sure that he is safe.

“Al’s gait pattern reflects his personality right now,” she notes. “He will go from taking very small, slow steps to taking huge strides, almost at running speed at a moment's



Exercise Results screen – patients often compete with themselves, trying to beat the speed and distance from the previous session.

notice. And so, we love to use the Gait Trainer with him, because it forces him to keep an even speed. Then with the feedback it gives him, we can have him take normal step lengths so that he is not over exerting himself or using up energy by taking tiny, quick steps.

“Similarly, with a patient in the FreeStep, we can give tactile cues that we would not be able to give without the combination of the harness protection and the Gait Trainer. We can use our free hands to tap their legs or give them feedback to let them know when they should be firing what or how they should be moving their leg while they are on the Gait Trainer, in the safety of the harness.”



With a patient in the FreeStep, we can give tactile cues that we would not be able to provide without the protection of the harness.

On the Gait Trainer, the patient can see virtually every aspect of their gait pattern, Ms. Klein explains.

“While they are walking, the big heads-up LCD screen on the Gait Trainer shows the patient their actual footstrike versus the zone that they ought to be in, in terms of step length. Each step shows the optimum footstrike zone, and if they hit it, they get the auditory feedback of a beep. They can listen for the consistent beeping while watching for the placement of the foot inside the desired zone. The patients also love to compete with themselves. They can see their gait speed and the time they have gone, and each session, they want to try to beat the speed and distance that they have gone before. It is a big motivational tool for a lot of the patients.”

For more information on Biodex Physical Medicine & Rehabilitation devices, please contact:

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