

## FEATURE

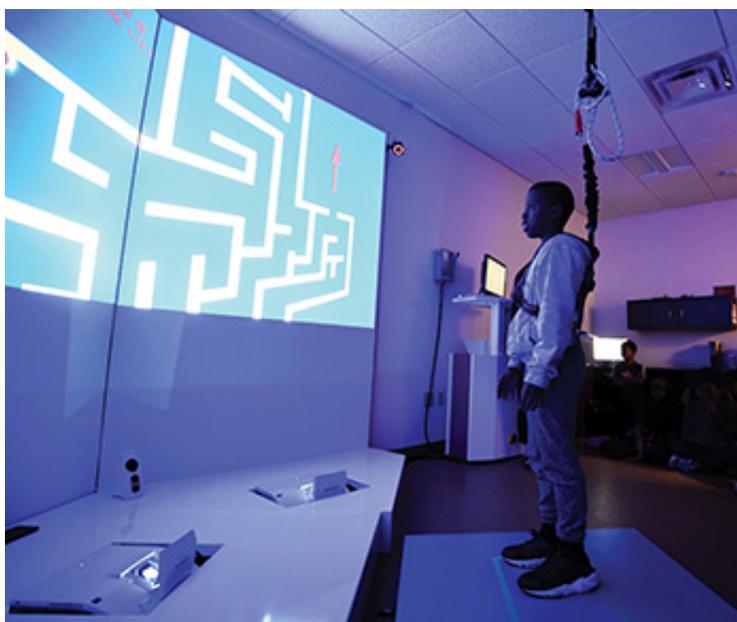
## Putting the Fun Into Functional Recovery

*Do some of your patients resist exercise? Try making it joyful.*

By Michele Wojciechowski | April 2018

Lively polka music surges from the treatment room as Dennis Klima, PT, DPT, PhD, MS, leads a patient in a dance. But he's not having a party. He's providing rehabilitation.

"I incorporate dancing as part of neuromuscular reeducation, as well as aerobic training," says Klima, an associate professor of physical therapy at the University of Maryland Eastern Shore. "Some of those dances can go on for 4 or 5 minutes without a break."



Klima believes he was among the first physical therapists (PTs) to use dancing as a technique in treating patients who are older. For 30 years he was artistic director and choreographer of the Ojczyzna Polish Dance Group. While he loves dancing, however, it was his patients who gave him the idea to add it to treatment.

Early in his career, while working with patients of Polish and Italian descent at a skilled nursing facility in Dundalk, Maryland, Klima learned that many of the

women had the same objective: to be able to dance at their daughter's or granddaughter's wedding. "That was a great goal to work toward," he says. Dancing fueled their enthusiasm and made the facility a draw for others.

Today, Klima also uses ballroom dancing—such as the foxtrot, the waltz, the cha-cha, and even swing—with patients of all ages. "I augment the music. I pick a tempo that's appropriate to the patient's level of function," he says. "To challenge them, I speed it up or use more difficult music, because I want them to progress. If the patient has greater impairments, I may start by holding onto them to help their balance and begin with basic weight shift to slower music with more assistance, then progress toward faster music with turns." The turns are important, he explains, because they challenge the vestibular system.

Klima also advises patients' family members and friends on how to dance with that person at home. "Not only is it really great for the patient, but it's also phenomenal for the family member or friend," Klima says. He even has his PT students take a mini-practical on incorporating dance with patients.

Klima and the other PTs profiled in this article have found that by making activities fun, patients are more willing to do their exercises and, therefore, can achieve their goals more quickly.

## In the Patient's Corner

At Rock Steady Boxing (RSB) in Indianapolis, a group of people don boxing gloves and for 90 minutes participate in noncontact boxing—hitting punching bags, shadow boxing, and building up a sweat. Besides being "ring mates," they have something else in common—they all have Parkinson disease (PD).

"Our patients like the novel aspect of boxing. Many had never boxed before," says Stephanie Combs-Miller, PT, PhD, an RSB medical advisory committee member. For a decade, she has been involved with RSB, a nonprofit, community-based boxing program specifically for people with PD.

"Rock Steady puts people in classes with others who have similar physical abilities and are at similar stages of the disease," says Combs-Miller. "They build cohesive groups, keep each other accountable for coming in, and form strong relationships with one another." She is an associate professor at the Krannert

School of Physical Therapy and director of research for the College of Health Sciences at the University of Indianapolis.

With programs in nearly every state and many countries, RSB provides boxing classes to help people maintain better function, balance, gait, gross motor movement, range of motion, posture, and activities of daily living. "RSB even has classes for people with lower levels of ability. They may do chair-based exercises, but it's the same concept. They still are doing boxing-type activities and exercising as intensely as they can tolerate," she says.

Over the years, Combs-Miller has conducted studies of the program's outcomes. "Most of the time we're using common outcome measures regularly used by PTs. We're interested in our patients' walking function, balance, strengths, quality of life, and other psychosocial measures," she explains. "We're also focused on cardiorespiratory outcomes and endurance in a high-intensity interval training program."

Working with community programs holds added benefits for PTs, Combs-Miller says. "In traditional physical therapy, we see people on a short-term basis. But with a community program such as RSB, we have an opportunity to collaborate and see how people do long-term with fun exercise," she says. "We also can partner with these programs help the members as well as our own businesses."

Every other month or so, RSB conducts a free health screening. "We triage patients based on their reports and either refer them to the appropriate PT—such as orthopedic or neurologic—or to another appropriate health care provider, such as a physician, occupational therapist, or speech pathologist," Combs-Miller explains. "These programs give people opportunities to exercise and build community. They also give PTs ways to expand their own practices and develop community partnerships."

## All the Right Moves

Instead of reaching out to established community programs, Jamie Haines, PT, DScPT, created PT-CONNECT (Physical Therapy-Chippewa Outreach in Neurorehabilitation and Education with Community Teams) at Central Michigan University (CMU), where she is an assistant professor in the doctor of physical therapy program.

"I had taught a class on neurologic interventions at 2 other universities that had programs similar to PT-CONNECT. When I came to CMU, I was teaching it again, and I knew that bringing in participants with neurologic conditions would help them and my students," says Haines. "I pair 2 students with a community partner—the term for the volunteers, who technically aren't patients." Most participants have chronic neurologic conditions such as multiple sclerosis, traumatic brain injury, spinal cord injury, stroke, and PD.

Haines' second-year students see the volunteers for 6 visits. After conducting initial evaluations, "They get to practice their intervention, communication, and handling skills, and they send the partners home with sustainable home exercise programs that have been put together specifically to help them address the issues they themselves identified."

Students assign fun-focused exercises to increase the likelihood that the volunteers will do them at home. "Research tells us that an engaged brain has better potential for recovery,"<sup>1</sup> Haines notes.

PTs know that exercise repetition can lessen recovery time, but it's difficult to get someone to keep doing the same thing over and over. "So," Haines says, "you make it fun. We have partners put on boxing gloves and make boxing moves. You couldn't normally get them to reach across their bodies 10 times in a row, but with boxing you can get them to do 300 reaches in 10 minutes." Besides boxing, her students use dance, music, walking to the beat of a metronome, and even competition to get partners to exercise. "We ask, 'How many sit-to-stands can you do with me?'" For some, competition builds camaraderie and gets them to do what they otherwise wouldn't.

Haines describes 1 patient in a wheelchair poststroke who was working on balance. He had been a hunter, so students set up paper targets of deer on a wall and taught him how to stabilize with the hand affected by the stroke, lift a Nerf gun, and shoot sponge pellets. "He hadn't hunted in a long time because he was in a wheelchair, but his eyes lit up doing this activity," Haines says.

She adds that even with fun activities some partners are fearful to participate. "When partners are too scared to try something, we use safe patient handling and mobility equipment, including overhead ceiling harnesses and floor-based

mechanical lifts," Haines says. "It's amazing to see what they will do when they know they can't fall. They will box, dance, run, and even kick a ball. Fear is a huge limitation for people with neurologic conditions."

## Hippotherapy: Not Just Horsing Around

If you see Lori Garone, PT, MS, walking next to a person on a horse, know that she's not involved in a horseback-riding lesson. Rather, she's providing physical therapy and incorporating hippotherapy into the patient's plan of care, as a certified hippotherapy clinical specialist.

According to the American Hippotherapy Association (AHA), "Hippotherapy refers to how occupational therapy, physical therapy, and speech-language pathology professionals use evidence-based practice and clinical reasoning in the purposeful manipulation of equine movement to engage sensory, neuromotor, and cognitive systems to achieve functional outcomes. In conjunction with the affordances of the equine environment and other treatment strategies, hippotherapy is part of a patient's integrated plan of care."<sup>2</sup>

"Hippotherapy uses principles of motor learning, dynamic systems theory, and sensory integration. It is intricately related to 3-dimensional pelvic motion transferred from the highly organized neurological system of the horse to the patient. The horse is the only animal that can provide the same pelvic motion that we use when we move," says Garone, who is AHA's second vice president.

Although hippotherapy most commonly is used with children, it can be used with adults, too.

Hippotherapy affects the neurological, vestibular, visual, auditory, motor, sensory, and gastrointestinal systems, says Garone. It's also fun. "We take the children out of the clinic and get them into nature. They're relaxed. They're happy. They enjoy being on a horse. They forget that it's therapy, so they're more motivated to participate in treatment."

## Playing Games

Danielle Levac, PT, PhD, MSci, doesn't always host children in the Rehabilitation Games and Virtual Reality Lab that she directs at Northeastern University (NU) in

Boston. But when she does, they tend to be in awe of the floor-to-ceiling screens displaying virtual worlds.

And, like most kids, they also like to play the video games—which are, however, for research purposes.

"I collaborate with engineers, game designers, and programmers to evaluate existing off-the-shelf commercially available games such as the Nintendo Wii or the Microsoft Kinect," says Levac, an assistant professor in the Department of Physical Therapy, Movement, and Rehabilitation Sciences at NU. "I also work with developers of rehabilitation-specific games that are being developed."

She says her research focus is on understanding existing games—which ones might be most relevant for particular patients, and which elements of a particular game will engage patients while getting them to perform desired movements. "I want to learn what it is about one game versus another, or one platform versus another, that might be most effective for learning, while also engaging and sustaining motivation," Levac explains.

When mainstream platforms such as the Wii and Xbox were introduced, clinicians were excited, she recalls, because they were the first gaming-based systems that incorporated full-body movements. "The games on those platforms were thought to be fun, motivating, and engaging," Levac says. They were a way to solve the problems of getting pediatric patients to perform certain movements at the appropriate times. And if the children had the game systems at home, they could continue their exercise programs there.

"Playing video games that have good design principles—giving rewards for behavior—can be fun and motivating, while helping patients regain function," says Levac. "We're all motivated by the visceral pleasure of getting rewarded for our performance. But we only are motivated if it's properly challenging," she notes. "If it's too easy or too difficult, we don't want to keep playing. Another important motor-learning principle is autonomy—patients' ability to choose what they want to do and when they want to do it."

"Patients' improved motor skills while gaming are only beneficial if they can transfer those skills to real-life activities," Levac explains. "If they learn a skill by playing a Wii game, they need to be able to mimic the movement to reach up to

get a cup, for example." (See "Using Motor Learning to Help Patients" in the February 2018 issue of *PT in Motion*.)

One caveat is that mainstream off-the-shelf games won't work for every patient, says Levac. Modifications may be necessary. "It can be as simple as turning off the volume for patients who are too stimulated by the auditory aspect," she notes. "But because Wii and Kinect don't allow you to adjust the difficulty levels of the games—other than choosing beginning, middle, or advanced—PTs can choose to add or take away an element to make the game easier or more difficult. For example, a PT might reduce a cognitive challenge by instructing the patient to focus only on the red balls in a game. Likewise, a PT could increase the challenge by having a patient play the game while counting backward from 20 by 3s."

Another issue may occur when a patient has the gaming system at home, Levac says. A PT may not know if the patient is playing the game as instructed or is simply playing it to get a good score, without regard to the PT's directions. This is where specially designed games come in.

## Tracking Data

When she was a college professor, Sheryl Flynn, PT, PhD, studied off-the-shelf video games and their use in rehabilitation. People were engaged and motivated to play, but she felt that something was missing.

"There was no data other than game scores—the player received so many points or earned stars. But what does that really mean in terms of a therapeutic outcome? That wasn't clear," says Flynn, founder and chief executive officer of Blue Marble Health. In addition, she continues, "People were motivated to a point, until they hit a level they couldn't pass. The games couldn't adjust to fit their skillset."

Flynn created her company to address these issues. "Off-the-shelf video games don't provide important information such as data about the human performance metrics. Nor is there an adjustment for skill level. I started Blue Marble Health to focus on evidence-based science that's entertaining; we value both things equally," she explains.

Another challenge, Flynn notes, is that PTs give patients home exercise programs

but have no idea if they're doing them—or, if they are, how much and how often. Blue Marble, therefore, has created programs that look and feel like regular video games but also track human performance metrics involving attention, memory, executive function, visual perception, and more. Clinicians can access this data to see how well their patients are doing with the exercise program at home.

After an episode of care ends, clinicians still can access the patient's data as long as they remain connected with the patient. "So, if a PT sees that 3 patients have started to slip in terms of how they are doing, that PT can contact them to see if they want to be evaluated to determine why their scores are decreasing," says Flynn. The company's performance analytics tools enable clinicians to assess patients, assign routines, and track progress. The tools also allow clinical administrators to collect population data through the reporting function.

The games run on Windows-based tablets and computers. They have 2 aspects—cognitive and physical. "The physical platform is focused on balance, fall prevention, vestibular impairments, arthritis, and COPD [chronic obstructive pulmonary disease]. The cognitive platform measures attention, memory, executive function, and visual perception," Flynn says. "And playing them is fun!"

Blue Marble Health was founded in 2011 with a contract from the Department of Defense. The military had been searching for a video game for concussion rehabilitation of troops returning from wars in Iraq and Afghanistan. While the company's focus on veterans primarily addressed the cognitive side, the balance and fall prevention in the physical program also can be used for veterans.

To develop the apps, Flynn interviewed clinicians, read workbooks on cognitive function, and researched scientific evidence and clinical guidelines to identify best practices for brain impairment interventions. "We did a study with these war veterans comparing our use of video games with traditional workbook cognitive rehabilitation," Flynn says. We found that—in a short period of time—the veterans had improved cognitive function more so using our game than they did with the traditional workbook."<sup>3</sup>

In an effort to address the potentially costly and catastrophic consequences of a fall, the apps also empower patients to track their fall risk. If fall risk increases, PTs are alerted and can encourage patients to visit the clinic to determine the reason.

In this way, PTs possibly can catch the decline in function before a fall actually occurs, Flynn says.

## Get Out of Your Head

When a young male patient from Brazil first came to PhysioFitness in Rockville, Maryland, he had been using crutches for half of his life. Clinic co-owner Jan Dommerholt, PT, DPT, examined the boy's knee. The patient flinched, although he'd received no diagnoses for this pain, which had lasted more than 3 years.

"What would happen if you walked without your crutches?" asked Dommerholt, who also owns Bethesda Physiocare Inc and Myopain Seminars. "I can't do that," the boy replied. No matter what Dommerholt said, the boy refused to walk without the crutches. So he tried another strategy.

Handing him a ball the size of a basketball, Dommerholt took the boy to a sports wall at PhysioFitness and said, "Just throw the ball at these lights." Because he couldn't throw the ball while using both crutches, the boy dropped 1. After hitting 1 of the lights, the ball went past the boy, who couldn't catch it. He went crawling after it. He kept doing the activity. He wasn't quite tall enough to reach the highest light, so he jumped—sans crutches—to complete the task. He reported no pain. After 10 sessions, he stopped using the crutches completely, even outside the clinic.

By making the boy focus externally—on the game and the ball—rather than internally—on his body and chronic pain—Dommerholt says that he was able to get the patient to work on his functional recovery while having a lot of fun. "Almost all chronic pain patients have kinesiophobia—they're terrified to move," explains Dommerholt. "That's why we use a strong external focus. The key is to make exercise enticing and to bring the fun back into functional rehab. An internal focus will limit people. If you emphasize what they cannot do, you emphasize their fears and anxiety—even if you don't want to."

For example, Dommerholt says he doesn't tell a patient, "Make sure you don't hyperextend your elbow, because you could pop your joint." Instead, he puts the patient in the proper environment, absorbed in an activity in which the patient naturally will do what the PT wants.

Patients at PhysioFitness jump on trampolines while catching Frisbees that are thrown to them, use a climbing wall in a black-lighted room with glow-in-the-dark holds, and evade laser lights in a room that resembles one in the movie *Mission Impossible*.

"Everyone loves it," says Dommerholt. "When they love what they're doing, they move again."

***Michele Wojciechowski is a freelance writer.***

## References

1. Kleim JA, Jones TA. Principles of experience-dependent neural plasticity: implications for rehabilitation after brain damage. *J Speech Lang Hear Res.* February 2008(51):S225-S239.
2. An Introduction to Occupational Therapy, Physical Therapy, and Speech-Language Pathology Incorporating Hippotherapy in Clinical Practice. Fort Collins, CO: American Hippotherapy Association, 2016. [http://www.americanhippotherapyassociation.org/wp-content/uploads/2015/02/AHA-Intro-PPT-for-MedProfessionals\\_9\\_28\\_2016\\_final-ver.pdf](http://www.americanhippotherapyassociation.org/wp-content/uploads/2015/02/AHA-Intro-PPT-for-MedProfessionals_9_28_2016_final-ver.pdf). Accessed January 10, 2018.
3. Kennedy BL, Wirthington N, Dupree PJ, Black J, Flynn S. Treasure in therapeutic neurogaming for cognitive rehabilitation. *Arch Phys Med Rehabil.* 2010(96):e30-31.

*PT in Motion*, APTA's official member magazine, is the successor to *PT—Magazine of Physical Therapy*, which published 1993-2009. All links within articles reflect the URLs at the time of publication and may have expired.

## Comments

I've been trying to tell my patients that PT doesn't stand for "pain and torture" but rather "Play Time." With ideas like these, I can see that catching on.

Posted by Russell Michael -> BFWZEM on 4/3/2018 2:05:05 PM

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