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A photograph of two young boys playing a Wii game in a living room. The boy on the right, wearing a blue shirt, is in a dynamic pose, swinging his arms as if holding a controller. The boy on the left, wearing a red shirt, is also holding a controller and looking towards the camera. The background shows a typical living room with a framed picture on the wall and a doorway.

A 'Wii' Bit of RESEARCH

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PT benefits from using Wii

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Issue

A 'Wii' Bit OF RESEARCH

The first published study shows PT benefits from use of the Wii

By Beth Puliti

It seems active video games are more than just fun. According to Judith Deutsch, PT, PhD, and colleagues, off-the-shelf gaming systems, such as the Nintendo Wii, can improve physical therapy results when used as a complement to standard of care.

In a case study involving a 13-year-old male with spastic diplegic cerebral palsy who used the Wii Sports software in conjunction with physical therapy, improvements in visual-perceptual processing, postural control and functional mobility were measured after training.

Although there have been plenty of press reports and scientific articles surrounding the Wii, lead author Dr. Deutsch believes their case study is the first published research showing physical therapy benefits from use of the wildly-popular gaming system.

An Available Alternative

Dr. Deutsch became interested in the Wii after developing two robotic virtual reality systems for walking.

"It was the combination of the virtual reality plus the robot that produced the greatest transfer of training to the real world," she revealed. "This reinforced the importance of the virtual environment to drive purposeful movement training and skill acquisition."

Dr. Deutsch and others presented the findings to the clinical community and became frustrated that the device was not commercially available. They could report results

that were clinically relevant, but were unable to translate that into clinical practice.

While developing specialized virtual reality rehabilitation applications, they began to test off-the-shelf gaming options as well. Dr. Deutsch and colleagues selected the Wii because it has similarities with their virtual reality system: it contains games and has an interface that provides visual, auditory and haptic (touch) feedback.

"We also selected the Wii because it is used widely in the clinic and we wanted to determine feasibility and efficacy," added Dr. Deutsch, professor and director of research in Virtual Environments and Rehabilitation Sciences Rivers Lab in the Department of Rehabilitation and Movement Sciences at the University of Medicine & Dentistry of New Jersey, Newark.

A School-Based Study

Before conducting their study, Dr. Deutsch and others posed the following questions: Can we bring a gaming system into a school and incorporate it into a child's schedule? Will he be interested? Would training with the Wii transfer to improved balance, visual spatial processing and walking?

The 13-year-old male student in the case study used both the training and game modes of the Wii Sports software, which included boxing, baseball, bowling, golf and tennis.

Over a four-week period in a school-based setting, he used the Wii while continuing to

receive physical and occupational therapy. Sessions were between 60 and 90 minutes long and training was conducted in both standing and sitting positions.

"We wanted to stimulate trunk control and symmetry in sitting (boxing), balance and endurance in standing," said Dr. Deutsch.

After 11 training sessions, the student improved his balance, visual spatial processing and walking. He continued to improve his walking, which was measured two months after the Wii program was discontinued.

"When you introduce a new technol-

Wii Words of Advice

Physical therapist Kimberly DePaul, DPT, offers a few tips to help prevent Wii injuries:

1. Warm up muscles and practice dynamic stretches just as you would before playing a game of touch football.
2. Ramp up slowly if unaccustomed to activity. Don't swing or bowl with all of your might the first few times; ease into it.
3. Be aware of performing a certain motion for a long period of time. Switch arms periodically or switch games after an hour or so.
4. Take a moment to stretch after every five to 10 minutes of play.
5. Stop playing if muscles become sore. Ice if pain ensues.
6. Don't compete or use more muscle energy than is actually required to play in the game.

'Injuries from the Wii are becoming more frequent due to its gain in popularity as well as the mechanism of injury.' —Kimberly DePaul, DPT

ogy into an environment, it is prudent to establish feasibility. It will also give you an idea of how to design a controlled study," said Dr. Deutsch.

Complementing Standard Care

Although the Nintendo Wii provides an alternative to high-cost, high-tech virtual reality rehab robotic systems, customized systems can collect information about the user's performance and be adjusted more carefully to meet the needs of rehabilitation clients than off-the-shelf systems, Dr. Deutsch noted.

She's not worried about standard of care rehab techniques being replaced by the gaming system either.

"The Wii will likely complement standard of care because it cannot be adjusted to meet all patients' needs. Research will probably

show that the combination of these therapies—not one in isolation—produces the best results," she said.

Dr. Deutsch would like to see more research to support the efficacy of the gaming system, but believes that if therapists are careful about how they chose to use the Wii and document what they are doing, it is reasonable to apply it in practice.

She hopes her case study provides some balance amidst all the hype. "In the coming year there should be a lot more published research on the use of gaming in rehabilitation," she said. Current research is focusing on the effectiveness of the Wii for people post-stroke, people with Parkinson's disease and the elderly population at risk for falls. The Wii is also being integrated into pediatric camps.

An Increase of Wii Injuries

Because of the Wii's growing popularity both in home and in the hospital, "Wiiitis" is also growing in popularity.

Kimberly DePaul, DPT, physical therapist at Excel Physical Therapy & Fitness, Philadelphia, PA, has seen a number of patients over the past year with Wii injuries. Sprains, strains and repetitive traumas (tendonitis) are the most common video game injuries she treats. Some individuals may be predisposed for injuries—or Wiiiitis as it's frequently called—due to past medical history such as low-back pain, herniated discs or arthritis causing exacerbation of their symptoms, she said.

"Injuries from the Wii are becoming more frequent due to its gain in popularity as well as the mechanism of injury. The distribution

Play Safe

Nintendo suggests following these safety tips when playing Wii.

1. Wear the wrist strap. Make sure that all players using the Wii remote are wearing the wrist strap and that it has been tightened using the strap lock. Wearing the wrist strap will help prevent the Wii remote from flying across the room if it's accidentally let go during game play.

2. Hold the Wii remote firmly and don't let go. Even while wearing the wrist strap, do not let go of the Wii remote during game play and do not use excessive motion. If you use excessive motion and let go of the Wii remote, the wrist strap may break and you could lose control of the Wii remote. This could injure people nearby or cause damage to other objects.

3. Give yourself plenty of room. You will probably move around while using the Wii remote, so be careful that all areas you might move into are clear. Make sure furniture, objects and people are out of the play area so you don't accidentally bump into them while playing. Also, it is recommended to stay at least three feet from the television.

4. For more information about Wii safety, visit www.nintendo.com/consumer/wiisafety.jsp

Resource: Safety Information for Playing Wii. (2009). Retrieved from the World Wide Web, www.nintendo.com/consumer/wiisplay.jsp

of the forces generated by your body movements are different between playing the Wii game and participating in the actual activity," Dr. DePaul explained.

If a patient develops Witiitis, he should

rest from playing any activity that causes increased pain so he doesn't further irritate the involved soft-tissue structures. Treatment depends on the body part(s) involved. However, stretching is essential to restore

the proper length-tension relationship of the muscles, Dr. DePaul noted.

Physical therapists should instruct patients in an efficient and effective plan of care, she said. "In doing so, patients will be able to enjoy the Wii and other sports/activities with proper body mechanics to avoid future reoccurrences." ■

Resource

Deutsch, J., Borbely, M., et al. (2008). Use of a Low-Cost, Commercially Available Gaming Console (Wii) for Rehabilitation of an Adolescent with Cerebral Palsy. *Physical Therapy*.

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A 'Wii' Bit of Research at [www.
advanceweb.com/pt](http://www.advanceweb.com/pt)