

Worth the DRIVE

Molly V. Strzelecki

Four and a half years ago, Patrick Rhein, a resident of Waterloo, Illinois, was in a severe car accident that left him with C-4 quadriplegia. With no use of his legs and little use of his arms, it was doubtful that Rhein would be able to care for himself without the help of others. Further, he certainly wasn't holding out any hope that he'd be able to drive again, but he figured it couldn't hurt to ask.

So ask he did.

"My doctor, Christina Sadowski, told me about the DRIVE (Driver Readiness Intervention and Exercise) program at Washington University [in St. Louis] and said that they were looking for someone. She said she would drop my name off, and hopefully, I would get in," Rhein says. A month later, he got the call that he had been accepted, acting as the subject of the master's degree project for occupational therapy students Jayme Eggum and Mark Showers.

DRIVE is a new pilot program designed to increase participants' strength, range of motion, and endurance by breaking down the various components of driving, leading to fewer required vehicle adaptations. Rhein was the first person to participate in the DRIVE pilot. In deciding on a candidate, Eggum and Showers looked for a person with high-level quadriplegia who was interested in returning to driving and who could commit to coming in to work out twice a week. No minimum level of strength, sensation, or body image was defined.

"It is really difficult for individuals who have severe arm or upper-body spasms to return to driving, for safety reasons," Eggum explains. "And adaptations to a vehicle for someone with a high-level spinal cord injury are very expensive. They can easily be \$100,000, and insurance doesn't consider driving

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something that is necessary. It's a bonus kind of thing, so they don't cover it, usually. We want to do anything we can to decrease that price, of course, and make driving a more achievable goal for people with spinal cord injuries."

Leonard Matheson, PhD, CRC, CVE, an associate professor for the Occupational Therapy program at Washington University, oversees the DRIVE program, having worked previously on similar studies. Matheson's work has dealt mainly with spinal cord injuries in young people, and driving, he found, is a big motivating factor for them.

Matheson, Eggum, and Showers had added help from BTE Technologies and its Primus RS. The Primus, explains Tim Seals of BTE, provides different levels of resistance to specific joints. The equipment also can accommodate several different tools, such as a steering wheel, for drivers who are not yet ready to be on the road. Through various software programs on the Primus, the user's informa-

tion is calculated and stored to monitor improvement.

Eggum and Showers worked with Rhein twice a week for 2 hours at a time on the Primus RS, focusing on "being able to do the activities of driving." They broke down the steps, such as braking, accelerating, and actually steering a vehicle, and saw Rhein improve an exorbitant 900%. As the first participant in the pilot DRIVE program, Rhein's results cannot be seen as typical. And although they are encouraging, occupational therapy practitioners need to recognize that each driving candidate should be given sufficient opportunity and realistic expectations and that driving is not always an option.

The DRIVE program itself was done in the clinic, but after completion (about 11 months) Rhein did behind-the-wheel training in an adapted vehicle with an instructor trained to work with persons with physical impairments. He practiced until he had built up the endurance to drive for 4 hours at a time before getting tired. To get a driver's license, Rhein had to take a driving and written Department of Motor Vehicles tests, both of which he passed.

"Occupational activities really engage people tremendously," Matheson says. "Having them do a meaningful activity engages them to a much higher degree and causes really good generalization of the benefits. Even though we're only focusing on driving, we can expect that a lot of other areas will be improved. It's not just physical reconditioning, it's also very much a psychological reconditioning and an attitude development."

In the end, not only was Rhein strong enough to drive with less adaptive equipment, but he was more capable of doing other activities of daily living independently.

“When we first started with Patrick, he’d do a pressure release by leaning forward into his lap, but he couldn’t sit himself back up,” Eggum notes. “He’s now able to not only sit himself upright, but he can use his left arm a lot better, so he can eat independently, [and] he can roll a lot better in bed. He can put on a jacket by himself, do his data entry job a lot easier, and can dry his body off after taking a shower. It’s really changed a lot of things for him.”

The focus on meaningful activities is the key ingredient that an occupational therapy practitioner can bring to a program like DRIVE. As Rhein’s driving capacity improved, so did his ability to engage in a variety of other occupations that were meaningful to him.

“Occupational therapy practitioners use the valued occupations of the person as the entry point for therapy, as well as the medium through which therapy is conducted, and as the goal of the therapy,” Matheson notes.

Using occupational therapy to help Rhein drive, and with less adaptive equipment, was the main goal of the DRIVE program. And now that that feat has been accomplished, all participants want to see the program drive on.

“We’re working with BTE, and we’re trying to ensure that it won’t stop here with Wash U,” Eggum says. “We’d like to give everyone who has the equipment in their facility the information that we’ve obtained on how they can start their own program.” Although working on equipment like the Primus RS can be incredibly helpful to persons with spinal cord injuries who want to drive again, it’s not a silver bullet for every client, and therapists need to assess each client individually.

Eggum adds that occupational therapists must be wary of assuming too little with their clients when starting therapy.

“Therapists working with people with spinal cord injuries sometimes have preconceived ideas of their limitations, and

this program proves that those limitations can be totally wrong,” Eggum explains. “Patrick has gone from the functional equivalent of a C-4 complete spinal cord injury to a C-5 on his left side and a C-6 on his right side. So dedication, exercise, and rehabilitation can do some really awesome things for someone with a spinal cord injury.” ■

Note: Dr. Matheson has contractual relations with BTE Technologies, Inc., but derives no benefit from the use of the equipment or test protocols described.

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