

Tech: Modified riding toy is about more than fun

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year. He's able to be part of that."

Matthew uses a motorized wheelchair that he controls with his left hand. A voice enhancer connected to a microphone helps other people hear what he says. And equipment specially designed by Alfred I. duPont Hospital researchers lets Matthew move his arms with ease.

The WREX, short for Wilmington Robotic Exoskeleton, is a system of multicolored, adjustable elastic bands and metal connectors that negates the effects of gravity on his arms. Deceptively low-tech in appearance, the mechanical equipment helps his arms reach and move around his body. Without it, his movements are restricted, the result of muscle contractures related to his condition.

With the WREX affixed to his chair, Matthew's right arm moves with a fluidity that resembles someone doing tai chi. The increased range of motion helps with tasks like eating, writing and typing on his iPad. After six years of wearing the WREX on one side only, Matthew recently was fitted for one on his left arm.

It's no coincidence that the WREX's design seems reminiscent of an Erector set. The team of researchers often tries to use engineering solutions to help children with serious medical needs. There's expected to be more opportunity for that work, thanks to a \$1 million donation from the the Swank Foundation to be used for continued research and care for children with cerebral palsy and other neuro-orthopedic conditions.

Although developed at duPont, the WREX is now available commercially at a cost of about \$2,000 to \$2,500. It can be used to help with movement related to other conditions, including spinal cord injuries and stroke, said senior research engineer Tariq Rahman. "It's pretty cheap for this kind of medical equipment," he added. "It requires very little maintenance."

For Matthew's father, there's another intangible benefit of the technology. "It takes the focus off his disability," Rich Kilgore said.

Rocket chairs

Twenty miles to the south, Galloway's team also is working on ways to increase mobility and independence among younger children with disabilities. Because these kids may not have the arm and leg move-



At the University of Delaware's Early Learning Center, Brenden Bolen, 18 months, takes a spin in an adapted toy ride-on car. THE NEWS JOURNAL/ROBERT CRAIG

ment of their typical peers, they often miss out on opportunities for social interaction and spontaneous play with the world around them. A power chair can help, but its bulky size can limit its use.

A few years ago, the team developed and tested smaller power chairs, dubbed rocket chairs, that allowed 2-year-olds to control their movement. In response to requests from parents, they've also created a portable power chair that doubles as a walker, weighs only 18 pounds and can fit in the back of a car.

The potential of these products has plenty of wow factor, but they aren't immediate options for families. They may be years away - if ever - from being available for purchase.

That's why Galloway and a group of engineering students have embarked on a new project of modifying ride-on toys for use by 1-year-olds with cerebral palsy. Each toy has an inexpensive push

pad inserted over the driver's wheel, replacing a smaller button that is harder to hit. Pushing the pad activates the battery and turns on the car.

Scooting along on a battery-operated car is a first for these young patients, who typically rely on parents, teachers or other caregivers to help them move. Getting the chance to move on their own makes a difference in how they maneuver their bodies and figure out what's going around them, said Terri Peffley, an occupational therapist whose son, Andrew, participated in the rocket chair experiment.

"How we develop is first learning how we control our bodies and then how we control our environment and things around us. If you don't get control over your movement, you get isolated," Peffley said.

So far, the team has outfitted two vehicles - a ride-on car that resembles Mater, the popular character from the "Cars"

movies, and a larger Barbie car with room for two children. Because these aren't intricate, expensive machines that take years to develop, there's an opportunity to open the world to these kids at an earlier age, which can help their socialization as well as their movement, Galloway said.

Although the project is just starting, Peffley said she can see a difference in Brenden Bolen, an 18-month-old learning how to ride Mater. He has begun

Kids with limited movement often miss out on opportunities for social interaction.

sitting up in the toy and using both hands. He gets mad when the battery is turned off. For him, it's not just riding on a toy - it's a workout for his body.

"It's become, 'Wow, look what Brenden can do,' instead of, 'Poor Brenden,'" she said. "He's really showing his potential to everyone."

In the future, Galloway hopes to allow families to take these toys home, but with additional equipment that will allow researchers to track the children's interactions off-site. The hope is that they can learn even more about how getting children moving impacts their developing bodies, minds and emotions - all while helping the youngsters.

iPad apps

While Galloway and Rahman are working on technology for the near future, some families are finding ways to make use of what is available now.

Smartphones have opened up a world of communication in recent years. Touchscreen tablets and apps also offer therapeutic potential, whether it's a teen with autism using a communication app on an iPad or a child with cerebral palsy working on improving fine motor skills with a game.

Kathleen DeNight initially bought an iPad for herself, but when she saw the number of special education apps available, she became interested in how it might help her son, Jackson, diagnosed with a pervasive developmental delay. She discovered iRewards, an app that keeps track of Jackson's positive behavior. Each time he follows through with a targeted behavior, such as not asking for candy in line at the gro-

cery store, he earns a star. When he earns enough stars, he is rewarded positively, such as with time on the computer or the chance to watch a movie.

The iRewards app, one of several the family uses for Jackson, mirrors the positive reinforcement strategy he gets at school, DeNight said. "It helps keep things in front of him and keep that support," she said.

DeNight is hoping to get the iPad included in her son's individualized education plan at Brick Mill Elementary School, where he will be going into fourth grade. She believes this kind of measurable technology can make a difference. She sees potential for Jackson to work with other students using iCommunicate, an app that asks two children questions about ways to start communication and then records their answers, encouraging them to work in tandem.

"Sometimes he struggles with the words. The fluency in speaking isn't there for him," she said. "Nothing is going to take the place of a person, but there are programs such as iCommunicate that I think will help other kids to understand. If they're able to walk through some of these games and programs, they may understand more about him."

While funding for assistive devices has improved in recent years, it's still a challenge to get technology items covered by insurance companies, said Beth Mineo, director of the Center for Disabilities Studies at the University of Delaware. So far, devices like iPads haven't traditionally been covered by insurers because they also can be used by people without disabilities. But it can be a lot cheaper for a family to buy an iPad than other more expensive devices that essentially do the same thing.

"It's a small investment with major returns," Mineo said.

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The Forgotten Decade of the Kennedy Half Dollars Never Released into Circulation

Since 1964 the Kennedy Half Dollar has been one of America's favorite coins ... nearly 50 years and still going strong.

Did you know the US Mint hasn't released a Kennedy Half Dollar into circulation since 2001? It wasn't meant to be a secret but it's true. Even more confusing, they did make a Philadelphia and Denver Mint coin for each of the last 10 years, but few knew how to find them ... until now.

