

Making strides with an upright walker

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From the iconoclastic VW Beetle to the swanky Mercedes-Benz, the vehicle of choice for baby boomers has followed the arc of their lives. As members of that generation edge into elderhood, they're increasingly adopting another mobility device: a medical walker.

Boomers are twice as likely to use walkers and other ambulatory devices than the previous generation - 6.9 percent versus 3.3 percent - according to a 2013 study published in the *Journal of the American Medical Association*.

The global market for these devices is projected to nearly double in size from 2013 to 2020, to \$8 billion annually. And medical equipment manufacturers are trying to offer an array of options, from walkers to crutches, canes, wheelchairs, scooters, "rollators" and more.

There's room for one more entrant, said the new San Diego company ProtoStar. Its product, the LifeWalker Upright, is marketed as not only providing mobility and protection from falls, but also something precious to people as they age: dignity.

The LifeWalker makes it easier for users to look straight ahead at other people, not down at the pavement, said David Purcell, the founder and chief executive of ProtoStar. The adjustable, wheeled walker fits around the user on three sides, enabling it and the person to travel together. Its special characteristics, including shock absorbers, caliper brakes and arm rests, are designed to offer comfort and impart confidence in walking.

Inventors like Purcell said they're filling an unmet need for products designed with the user in mind, based on scientific principles governing human locomotion. These individuals include Anurag Purwar, a research associate professor in the department of mechanical engineering at Stony Brook University in New York.

Purwar designed a device that raises a person out of a chair and functions as a walker. He was inspired by a man who had difficulty walking because of post-polio syndrome. A search of existing devices found none suited to personal use, he said.

"We did some research and realized there is a bigger market," Purwar said. "They are people who have multiple sclerosis, cerebral palsy ... the causes may be different, but they all need help getting up."

That was seven years ago. His device, called Mobility Assist, has been licensed to Biodex Medical Systems and is close to production, Purwar said.

Likewise, the LifeWalker Upright is in pre-production stage as its final form takes shape.

ProtoStar faces an uphill struggle because of the competition in an established market, said mobility researcher James Lenker, an associate professor in the department of rehabilitation science at the University at Buffalo. The LifeWalker Upright's price point of nearly \$1,800 is also a deterrent, Lenker said.

"In the U.S., people with disabilities are among the lowest incomes, as a group, of any demographic," he said. "So this is clearly a product targeting wealthy people. It's not going to be something that the average 80-year-old with degenerative joint disease or arthritis or recovering from a stroke will typically be able to afford."

Even consumers who can afford that price might find it more attractive to buy a powered scooter, Lenker said. That would provide superior mobility to get around the community and perform everyday tasks like shopping.

Or for a few hundred dollars, people could buy an adjustable walker to be used in addition to a powered scooter.

Lenker said because he hasn't seen the LifeWalker Upright's design details, his comments only go so far. The test will come in the marketplace, where customers will judge whether the device's features make it worth the cost.

Like the case with Purwar's Mobility Assist, inspiration for the LifeWalker came from personal need.

In Purcell's circumstance, it was his wife, Jean Purcell. She's in her 70s and dealing with rheumatoid arthritis, a movement disorder called cerebellar ataxia, a spine condition called rotoscoliosis and chronic obstructive pulmonary disease, or COPD.

Jean Purcell said she repeatedly fell while using her old walker. She also found herself looking downward, in a slouched posture that she disliked.

That's when her husband, a retired electronics inventor who founded the San Diego printer maker Encad, stepped into the picture. Drawing on his engineering expertise, David Purcell researched how walkers function and finally chose to design one.

His invention gained support from some of the most respected biomedical professionals and investors in San Diego. ProtoStar's board members include Peter Farrell, the founder of ResMed; Dr. Drew Senyei, managing director of Enterprise Partners; and Dr. Steven Garfin,

chair of UC San Diego's orthopedic surgery department.

ProtoStar plans to introduce LifeWalker Upright at the Feb. 18-20 meeting of the American Physical Therapy Association in Anaheim. The device will be sold directly to consumers via the company's website and phone number.

The \$1,795 price is not reimbursable by medical insurance, although ProtoStar plans studies to assess the device's medical benefits. If the research confirms certain benefits, then ProtoStar can then legally make various marketing claims.

Jean Purcell said she feels a benefit. She had trouble maintaining balance with previous walkers, which are often jury-rigged with tennis balls for easier sliding.

"They're very hard to work with, and they're not secure at all," she said. She then went to wheeled walkers with seats, but they also had drawbacks.

"You have to lean over like you would with a grocery cart," she said.

"Pretty soon, your back begins to curve and it affects your breathing and your heart, because you're not standing up straight and you're looking at the ground."

The slouched posture is known to cause problems, David Purcell said.

"It's unsafe and there are thousands of people who fall from their walkers every year and end up in the E.R.," he said. "I was in the manufacturing business, and I thought I could design something better than that. So I spent a year doing drawings and analysis of Jean's gait and her problems, and doing ergonomic studies, human factors, research, photos of her in the optimum positions, measurements. And I started to

develop a design."

At the end of the process, Purcell said, he was convinced that his invention could help others, not just his wife.

"That was so important to me," he said. "Otherwise, I wouldn't have gone back to work. I don't have to work. I was retired, I had a great and fulfilling career with Encad."

To get the design into a computer-usable format, he held an online contest.

"Some guys from Serbia came up with the best concept," he said. "So I began working with them, and eventually got a former Encad employee who had worked for me to do a mock-up."

Garfin, the UC San Diego orthopedic surgeon, said an upright posture helps takes weight off the heart and lungs. But scientific testing will need to be done before claims can be made about that aspect of the LifeWalker Upright.

"We don't have any proof of this, except my wife will tell you she feels a lot better," David Purcell said. Testing is also being done to see if use of the device can relieve pain and reduce the weight load on joints.

ProtoStar has run on private investment so far, David Purcell said. The company is seeking to raise about \$3 million in venture capital in the next month or so, he added.

Purwar, the Stony Brook professor, said different disciplines need to talk to each other about patients' needs if they're to make further progress with mobility devices.

"We have physical therapy, we have mechanical engineers and machine designers," Purwar said. "If you want to help people, these fields have to come together. Instead of living in silos, if physical therapists interacted more with machine designers, they'll find that machine designers can solve problems."

The LifeWalker will be available at lifewalker.us and by calling 877-488-0822.

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