



## There is more to sport wheelchairs than speed. Rehab professionals can take techniques and technology back to the end user.

By Andria Segedy

**M**aking minor adjustments to camber or axle position can result in major changes to the quality of life of a wheelchair rider, according to a Paralympic athlete who began questioning the structure of his first wheelchair 30 years ago. Elite athlete Jim Martinson began by fine-tuning his chair to work for him, not against him, he tells *TeamRehab Report*.

And Martinson hopes what he learned long ago is something rehab professionals will understand today: The slightest adjustment—adding 2 degrees of camber or taking the weight off the casters—can make a wheelchair rider’s push and turn dramatically easier. Based in Seattle, Martinson is the newly appointed director of sponsorship for Quickie Designs/Sunrise Medical, Fresno, Calif. In 1980 he started the Shadow line of sport wheelchairs and adapted ski equipment, which was acquired by Sunrise Medical in 1992.

Manufacturers and athletes agreed that positioning and product design tested during the rigors of high-level competition can benefit the more than 250,000 wheelchair riders in the United States. For the 3,000 elite athletes from around the world who competed at the 1996 Atlanta Paralympics in August, making the right adjustments to their wheelchairs meant the difference between a gold medal and an honorary mention in their local newspaper. Changes these athletes make to get a competitive edge might be too dramatic for the everyday rider, Martinson says. “But if you take a small bit of it, set the wheels with just a little bit of camber, or move the axles forward farther, the chairs would track easier and move easier.”

Take the information from elite athletes and “pass it on to the grandmas and children in wheelchairs,” he says. “It would make their experience in their everyday chair much better.”

“The key is how people are positioned

in their chair and how it fits them,” says Chris Peterson, manager of product development, Action Top End, St. Petersburg, Fla. In the early 1980s, Peterson started manufacturing sport wheelchairs as Top End, which was acquired by Invacare in 1995. “You can have the fanciest paint job and wheels, but if you are not positioned correctly, you are not going to be effective?”

Athletes started using rigid chairs in competition because the chairs are stronger and provide quicker response than a chair with a folding cross brace. That has transferred to the regular end user, Peterson says. “When you looked into the stands at the Paralympics, you saw more people using rigid chairs,” he says. “There are more quads using

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**“How an athlete’s wheelchair is set for a sport could be applied to everyday use.”**

**-Jim Martinson,  
Quickie Designs/  
Sunrise Medical**

# Sport Wheelchairs

them because they are easier to wheel and still light enough to get in and out of a car."

Adding camber to wheels for quick response trickled down from what athletes use in court sports, Peterson adds. Action by Invacare introduced a camber bar in November that can quickly be switched at the axle by any manual chair user.

The Paralympics has shown that there are more ways to accomplish seating and positioning, agrees Wayne Grapes, national sales manager for Kuschall of America, Camarillo, Calif. Grapes also has been a U.S. track and field official for disabled sports for 12 years and officiated at the Paralympics.

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**-John Box,  
Colours by Permobil**

in their approach to trying a new style or design," Grapes says. Manufacturers will test chairs at various sporting events, he explains. "They use it in a sports application and then they see if there is a crossover application for the everyday user."

During the Paralympics, John Box, president of Colours by Permobil, Anaheim, Calif., took special note of the winning basketball team's wheelchairs. The Australians brought a streamlined offense chair design to the courts in Atlanta, he says, and their men's team took home the gold medal. "That really contributed to their success," he says,

adding that Colours introduced Hammer, a version of that design, in October.

The casters of this chair are welded inside the frame, Box explains. No part of the chair sticks outside the frame, meaning it can't get caught on a competitor's wheelchair. Much like a bumper car, it just bounces and keeps turning, never getting stuck, he adds. Some of those chairs have existed in other sport markets, such as rugby, but the Australian team really identified the value of that design and applied it to basketball, he says.

A chair design that remains illegal on the basketball court, but successful on the tennis court, is the recent development of the fourth wheel on the three-wheel chair, Box says. The wheely bar anti-tipper has increased the performance of the tennis chairs dramatically, he says. It has provided more stability as well as performance, he explains, giving the chair a turning access similar to a fork lift, a radical abrupt movement. "It allows the person to respond much quicker with not as much chairresistance."

But like the Hammer wheelchair, which comes in three models specific to three different sports, the price tag of between \$2,000 and \$2,500 for sport-specific chairs can be out of reach for many consumers. "Sports are excellent for the development of wheelchairs," Box says. "Funding is terrible for the development of wheelchairs."

The trend toward specialized chairs for specific sports does exclude weekend athletes from being top competitors, because they can't use their everyday chair and be serious competitors, athletes and manufacturers agreed. But specialized chairs are opening up doors from new sports that

allow people previously excluded from sports to play.

In the 1970s only basketball-specific chairs were available for sports enthusiasts, Martinson says. In the 1980s more sports opportunities became available. "Now individuals have the opportunity to ski, mountain bike downhill, race, play tennis, basketball, quad rugby, on and on and on. Sometimes it's a good problem to have to choose a particular sport you want."

In fact, the choices are about to grow. Box says he recently started Sports on Wheels, an association for wheelchair hockey, which is played on a hard-court surface at roller rinks.

Mark Shepherd, manager of disabled sports, U.S. Olympic Committee, Colorado Springs, Colo., noted that national governing bodies of various nondisabled sports are investigating the disabled sports arena to expand participation.

"Cycling has contacted me on how to get handcycles into events," says Shepherd. "Several national governing bodies want to be involved with people with disabilities."

"It takes several years for the success of elite athletes to get to the end user," says Barry Ewing, who owns Eagle Sportschairs, Snellville, Ga. "But that's the reason now that we have such streamlined rehab chairs and everyday chairs. They use all this technology that transfers to the end users."

Adds Martinson, the trickle-down effect from the 1996 Paralympics is just beginning. "Maybe we haven't learned as much as we need to. Information is still coming back to the engineers, meeting with core athletes, so designers know what can be out there for everyday use." |