

gizmo

THE TETRA SOCIETY OF NORTH AMERICA: CUSTOM ASSISTIVE DEVICES

FREEDOM ONE STEP AT A TIME



HAMILTON: Rowan Rader wanted to walk, run and play outdoors like any other six-year-old, but there wasn't a walker available that could allow him any kind of independence.

Children's walkers would not let Rowan, who has diplegic cerebral palsy, cover grass, gravel or even pass over cracks in the sidewalk – but worse, they would frequently tip. It meant his parents had to always help him play outdoors.

"Traditional children's walkers are not made to be taken outside, which is ridiculous when you think about it," said mom, Amanda.

"Especially when you think in terms of a six-year-old boy who does not see himself as disabled – who tells me he wants to run around and play.

"Rowan wanted to play soccer. Our existing walker could not get across the grass, and Rowan could not move – we were running behind pushing the walker.

"How embarrassing to have your parents pushing you around! He didn't complain, but we were controlling him. He's not the kind of kid that needs someone controlling him, but his walker could not go over any uneven ground. It would tip over and he would fall."

Then the family, from the Hamilton suburb of Ancaster, bought a cottage in Tobermory, a four-hour drive away on Lake Hudson.

"He couldn't play outside at the cottage," continued Amanda. "We couldn't go for a family walk without having to pull him around in a bike trailer."

Then she learned about Tetra from a parents' Facebook group. Amanda contacted Hamilton coordinator Sylvia Baliko – and was



WHEELS TURNING: ROWAN RADER OUT AND ABOUT IN HIS NEW TETRA ALL-TERRAIN WALKER, SEEN RIGHT WITH HIS FRIEND POPPY.

would give Rowan a better turning radius – but he found it difficult to stay in a straight line. Mike locked the rear wheels so they turn in a single direction. Once Rowan is stronger and more used to it the family can free these to turn in all directions."

Amanda is delighted with the completed all-terrain walker, saying it was "nothing we could have gotten anywhere else," and that it gives her son an amazing level of freedom.

"Seeing him have independence is a great feeling," she said. "It's about him walking – that's what he wants to do. If I thought he'd sit in a wheelchair that would be fine, but he doesn't want to.

"He said he wanted to walk, and I said I'd do anything to help with that. With the new walker he just gets to be a kid, and that's cool."

Even better was what came next – after getting the hang of his new walker, Rowan decided he'd get about with even more independence.

"Shortly after we got this walker he took independent steps on his canes, which I never thought he'd do," Amanda said. "We were at the cottage and we'd walked more than a kilometer, and then he decided he'd walk with the canes by himself. Usually I walk behind and help him, but he said 'Let me get my balance,' and he walked by himself.

"Having this walker helps him build up strength. He's using a lot of muscles to push the walker along."

TETRA SOCIETY OF NORTH AMERICA

THE TETRA SOCIETY OF NORTH AMERICA IS A REGISTERED CHARITY THAT ASSISTS PEOPLE WITH DISABILITIES TO ACHIEVE INDEPENDENT AND FULFILLING LIVES THROUGH THE CREATION OF CUSTOM ASSISTIVE DEVICES. TETRA TAKES THE VIEW THAT THE BARRIER IS CAUSED BY THE PHYSICAL LANDSCAPE RATHER THAN THE DISABILITY, AND THAT MODIFICATIONS TO EQUIPMENT CAN ALLOW PEOPLE WITH DISABILITIES TO FUNCTION MORE IN SOCIETY.



THE ART OF THE POSSIBLE

LONDON: Tetra volunteers are helping artists with a range of disabilities to express themselves with paint.

London's Participation House, which provides support and recreation for people with disabilities, asked for four adjustable easels for their 'Possibilities in Paint' program.

The first easel was designed and fabricated by long-standing volunteer Joe Ruitenbeek, who opted for a table-top aluminum frame design.

"They wanted a standard, three-legged easel, but these take very little to knock over," Joe noted. "The people doing the painting have little control over their touch on the canvas."

"The class needed something more rigid, and something people in wheelchairs could get closer to. So we decided to make a short easel fastened to a table-top people could wheel under," Joe said.

"Their canvas can swing sideways, up and down or be rotated as some painters can do vertical strokes but cannot do horizontal."



REGENA KRESS PAINTED THIS PRIZE-WINNING ARTWORK FALL LEAVES ON THE NEW EASEL AT PARTICIPATION HOUSE

Sew This is TETRA

VANCOUVER: Volunteer Kay Matheson produced three ingenious projects in her first month with Tetra: a wheelchair baby seat, an adapted industrial sewing machine, and a system to prevent groceries tumbling from the trunk of a car.

Kay's first meeting with the Vancouver chapter was in September, during which she took on the trio of projects – largely because they involved industrial sewing.

"I've always worked with my hands," she said. "My dad was a jack-of-all-trades and I grew up alongside him using all the tools he used. I started using a sewing machine at five or six, which is a good way of getting you thinking in three dimensions."

The first project was a baby carrier for a mother currently receiving care at Vancouver's GF Strong Rehab Centre who wanted to hold her tot at eye-level.

"Sam, the new mom, originally asked for a stroller to use with her wheelchair," detailed Kay. "When I went to see her I realized that what she really wanted was to get face-to-face with her baby."

"She was only able to hold her daughter, Abby, for a couple of minutes, and, although they could lie together on the bed, she really wanted eye contact."

Kay realized she could bend three-quarter-inch aluminum tubing to form a frame which would hold a sling, in which Abby could be held in comfort at a 45-degree angle. The tough part was attaching this to mom's wheelchair, which could not be drilled or permanently modified as it belongs to GF Strong.

BABY LOVE: MOM SAM GETS EYE-TO-EYE WITH BABY ABBY. AND (LEFT) DIANE OPERATING AN INDUSTRIAL SEWING MACHINE.

Kay fitted wider diameter tubes to the lower part of the armrests, into which the baby carrier pushes like the slide of a trombone. "I spent hours thinking that attachment out, although it seems simple now!"

The second project was for a lady who did a lot of stitching by hand but wanted to operate an industrial sewing machine. Although she has upper body mobility she's unable to use her legs to operate the foot control.

"Diane sews with a craft group," explained Kay. "Although she'd need to use both her hands for sewing, I saw she could bend from the waist. So I used this forward motion."

"The pedal of an industrial sewing machine is integrated into the table, and I wanted to find a way for Diane to push against this rather than modify the machine – then she'd only ever be able to use that one piece of equipment."

The solution was to have her lean against a lever, created from a modified crutch, which is held in place at one end by a receptor on the foot pedal and at the other by a belt around Diane's waist.

The third project was a tailgate grocery restraint for a lady who uses a wheelchair and had struggled to open the trunk of her SUV without items rolling out and hitting her legs.

Kay's solution was to build a vertical 'shelf' of plastic cut from a 55-gallon polyethylene barrel with aluminum support and nylon webbing, which attaches to anchor points at the rear of the vehicle. Strong and lightweight, it stashes away neatly when not required.



PRIVATE EYES: SCOTT BULBROOK AND YIH LERH HUANG PUTTING THEIR EYE-MOVEMENT-DRIVEN SYSTEM THROUGH ITS PACES.

The EYES Have it

OTTAWA: After 20 years of communicating solely by glances, Jessica was able to speak out loud to a friend through an ingenious project devised by two Tetra volunteers.

Scott Bulbrook and Yih Lerh Huang, of Tetra's Ottawa chapter, had been asked to help the 42-year-old communicate. Jessica suffers locked-in syndrome, a rare condition where an individual is aware but cannot move or speak as virtually all voluntary muscles in their body are paralyzed. (Jessica is not her real name – the client asked not to be identified.)

THEY DEvised A BLINK DETECTOR SYSTEM THAT SCANS FOR EYE MOVEMENT AND FEEDS THIS INPUT INTO A COMPUTER, WHERE AN INTERFACE ALLOWS BUILDING SENTENCES THAT ARE SPOKEN ELECTRONICALLY.

Due to lack of head control, commercially available eye scanning devices are not useful. The Tetra solution consists of a simple pair of glasses with an embedded USB camera. Software scans the video feed for eye movement and sends a control signal to software that emulates the client's existing communication method.

Based on inexpensive components and some highly technical programming, it gives opportunities to people with disabilities so extreme that mouth operated sip 'n' puff controls are not feasible. The computer

system gives options ranging from speech synthesis to surfing the 'net.

Scott fabricated the input device while Yih Lerh wrote and updated the software. Scott started with a USB borescope (\$10.99 at Amazon), which he attached to drug store reading glasses (\$2), onto which he also fixed a tiny craft store mirror (\$2). The hardware bumped the cost up another couple of dollars, but the camera and holder came in under \$20 and can be put together in an hour.

The borescope – the type plumbers snake down pipes to view blockages – faces forward, getting footage from a reflection of the client's right eye.

But the real challenge is working with the client to deliver something that matches the way they already communicate. In this case, Jessica's system breaks the alphabet into four main groups from which she locates individual letters.

"She has been blinking conversation one letter at a time – for 20 years."

The computer version adds a fifth row of options, containing operations including deleting a wrong letter, clearing the buffer to start over and best of all, to speak the contents.

"The first time we tried it she got the machine to say hello to a friend," said Scott. "It was the first time in 20 years she'd had a voice. It was an emotional moment for us."

Jessica is still getting used to the computerized system, and Scott and Yih Lerh are considering its potential for a wide range of clients and looking into further applications.

"The biggest challenge is perfecting the language interpreter," said Scott. "You have to follow the client's own way of communicating."

CORRECTION: IN THE PREVIOUS EDITION OF GIZMO OUR STORY ON AN OTTAWA PROJECT TO LINK STROLLERS WRONGLY IDENTIFIED MEDICAL STAFF INVOLVED WITH TETRA. IT WAS ACTUALLY OTTAWA CHILDREN'S TREATMENT CENTRE THAT RECOMMENDED OUR ORGANIZATION, AND WE THANK THEM FOR THEIR CONTINUED SUPPORT.



REELIN' IN THE YEARS

PRINCE GEORGE: Enable a man to fish, and he'll sit in the sun all afternoon having a great time.

Tetra exists so that people with disabilities enjoy the same options in life as everyone else. If your passion is fishing it's as important to your sense of self and wellbeing as any other activity.

Earlier this year, the Prince George chapter was challenged to devise a fishing rod for Dean Rigler, who has extremely limited grip strength due to injuries to his hands.

"Dean fishes on the ocean, out Kitimat way, and in lakes nearby," said Nadine Lindstrom, Prince George chapter coordinator. "Every August he goes to Babine Lake for the sockeye salmon run, which is a three-hour drive from here.

"He was injured ice fishing, when his fingers froze after he handed his gloves to some kid who couldn't find his own."

The project went to volunteer Steve Seebach "as he's Prince George's MacGyver," who made a couple of simple but ingenious modifications to a regular fishing rod.

The end of the rod slips into a Dewalt tool belt holster which Dean wears on his left forearm, strapped securely into place with two dog collars, and he grips a Weed Eater handle that's attached behind the reel. It's both secure and easy to attach and remove.



BIGGER FISH TO FRY: (TOP PHOTO) DEAN RIGLER DEMONSTRATING TETRA'S LIMITED GRIP STRENGTH FISHING ROD. ABOVE, WEED EATER FISHING GRIP.



DOG DAYS: MARILYN GERMAINE GIVES SERVICE DOG MANNIE A TREAT

Food for Thought

CALGARY: It's a lot easier to train your new service dog if you can reinforce good behavior by giving out treats.

That's why Marilyn Germaine, who is tetraplegic, asked if the city's Tetra chapter could devise a dog kibble dispenser.

"She has a new service dog, a young Labrador named Mannie," said volunteer Jim Perry. "I looked at different ideas but came up with a ratchet and pawl system, built into an ABS pipe cap."

When she moves a lever a wheel that stores 23 pieces of kibble ratchets forward one click, and a dog treat falls into a dispenser.

Tetra *thanks!*

- Allard Foundation
- BC Rehab Foundation
- Brampton and Caledon Community Foundation
- Community Foundation of Mississauga
- Community Foundation of Ottawa
- Jim and Leslie Guenter
- Harold E. Ballard Foundation
- ICBC
- Investors Group
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- Oakville Community Foundation
- Pilkington-Henniger Charitable Trust
- Province of British Columbia
- Royal City Men's Club
- Sifton Family Foundation
- SurreyCares
- Telus
- Variety - the Children's Charity of B.C.

The Tetra Society of North America thanks the organizations above for their recent support. We extend our sincere appreciation to all supporters for making it possible for our caring, dedicated volunteers to create custom assistive devices for people with disabilities. Their generosity is greatly appreciated.

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TETRA SOCIETY OF NORTH AMERICA

DEDICATED TO ASSISTING PEOPLE WITH DISABILITIES TO ACHIEVE AN INDEPENDENT AND FULFILLING LIFE, ONE ASSISTIVE DEVICE AT A TIME

Have an idea for a project? Want to know what's possible? Want to overcome a barrier?

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