

gizmo

THE TETRA SOCIETY OF NORTH AMERICA: CUSTOM ASSISTIVE DEVICES

Preschool project proves accessibility is childsplay

TORONTO: Thanks to two of Toronto's Tetra volunteers, kids at Grandview Children's Centre are now rolling on three wheels.

Working with occupational therapist, Kathy Sparrow and her colleague, physical therapist Michael Cheung, Tetra volunteers Jillian Fairley and Brian Light modified a tricycle for children who participate in Grandview's Preschool Outreach Program.

The tricycle is now in use to rave reviews of all the children.

"It was a challenge to find an economical solution that would bring adapted tricycles to preschools," says Kathy Sparrow. "We really wanted our clients to have the chance to enjoy bike riding with their peers during outside play time. In addition, we needed to find one trike that would meet the requirements of a number of different children with a variety of needs. That was a huge challenge for us."

She continues, "There are fully adapted tricycles available on the market but they cost thousands of dollars and not all children require that much support. Sometimes just a more supportive seat belt, straps to hold feet on the pedals or a chest harness could make a common store-bought tricycle suitable for many children with a variety of disabilities. I thought it might be possible for the skilled volunteers at Tetra to help us find a solution."

As a result, Kathy contacted Susan Coates, coordinator of the Toronto and York Region Tetra chapters who got the wheel rolling. Volunteers Brian Light and Jillian Fairley devised a solution that met the needs of children with a range of disabilities.

Using a regular tricycle, the two volunteers added a harness and foot holders with strong

adjustable Velcro straps designed to easily fit any young child. To verify the practicality of the solution, they did a test run with Brian's three-year-old great niece and the result was a huge success!

Clinicians at Grandview were excited when they saw the pictures that were sent to Kathy prior to the trike's delivery. When they trialed the tricycle it went well but discovered that a minor modification to the pedals was needed. Now in full use, the tricycle is receiving rave reviews from both children and their parents.

Located east of Toronto, Grandview has provided rehabilitation and education services to over 17,000 children and youth with special needs and their families since 1954. It is the only outpatient rehabilitation facility for young people in Durham and offers a wide variety of programs.

One of the Centre's programs is the Preschool Outreach Program, which helps children function in their local preschools and daycares. Its main facility is in Oshawa and was built by the

DEALS ON WHEELS



KAYDEN PUTTING THE TETRA TRIKE THROUGH ITS PACES.

Simcoe Hall Women's League in 1983. There are also two locations in Whitby and Ajax. A planned expansion of Grandview includes a new building to replace current locations is being considered.

Brian Light is a former Tetra client with muscular sclerosis who liked the energy and projects of the organization so much he decided to become a volunteer. Jillian Fairley has a background in mechanical and biomedical engineering and is preparing to go to medical school in the fall of 2011.

HANDCYCLIST GETS AHEAD, TOWING WHEELCHAIR BEHIND

CALGARY: Students working with Tetra volunteers came up with a device to allow a client to mix cycling and socializing.

Ryan Yeadon approached Tetra and asked for a way to tow his wheelchair behind his handcycle, so that he could cycle to see friends – and not spend the whole visit seated in his bike.

It was a perfect project for students at University of Calgary's Department of Mechanical Engineering, who completed a towing hitch as part of their mechanical engineering student design project.

"Ryan was frustrated with the poor maneuverability of the handcycle which prevented him from using it at his destination," explained team member Stephanie Coupal. "If he cycled to visit a friend he was unable to go into the friend's house with the handcycle."

Their solution, dubbed the "Handcycle Helper," clamps to the axles of the bike and the chair, with a metal bar that clicks into place. A ball and socket joint keeps it maneuverable, and Ryan is able to attach and remove the bar independently.

Return to strummer camp

HALIFAX: Guitar strummers are a perennial Tetra project – popular because of the number of people with a passion for music – but it’s unusual for a volunteer to be working on two at the same time.

Typically these devices enable someone that has suffered an injury or a stroke, who has lost function in one hand, to return to the guitar. And, typically, it’s an emotional result for a musician who had believed, up to that point, they would never play again.

Halifax volunteer Richard Sircom is currently putting the finishing touches to a guitar strummer that gives the highest possible level of pick control for a man who lost an arm in a farming accident. He is also working on a different system, which he might even motorize, for a female stroke victim.

It’s only fitting then that Sircom worked on the granddaddy of Tetra guitar strummers, alongside volunteer Jean-Louis Gratton, back in 2007. This battery operated strummer, created for a busker who had suffered a brain injury in a vicious beating, garnered considerable press attention and inspired other musicians to come forward with similar requests.

Subsequently, volunteers at the St John’s, NL chapter created a strummer using a drummer’s hi-hat stand to obtain a foot-operated up and down motion, which Sircom holds in his highest admiration for its simplicity.

Sicrom’s current project adds an extra element – the foot pedal, when used from different angles, can create “a single strum or a down-up strum.”

While observing that the client “may not need the volume control as he likes to just blast it out,” his original design was based on the thought that “in two months’ time he would want something more challenging.”

He intends to take several elements from this design into another project requested by a lady who has lost the use of her left arm after a stroke.



ACCESS ALL AREAS: TETRA PROJECTS ENABLE BARRIER-FREE FAMILY INVOLVEMENT.

Access for all ages starts in the home

SALT LAKE CITY: Projects completed by Tetra volunteers enable children with disabilities to take part in everyday family activities such as bike rides, computer games and playing with the family dog.

Projects such as these are deceptively simple: While the engineering challenge may be modest, the outcomes are immeasurable. Children receiving these devices can do the same things as their friends and siblings, while parents are able to arrange family activities that do not discriminate against their disabled youngster – everyone can take part in that bike ride!

The Salt Lake City Tetra chapter has recently completed modifications to three everyday items that allow two children in the city to take part in recreational activities with friends and family members.

The first allowed a seven-year-old boy with cerebral palsy to play fetch with his service dog.

Volunteer Kevin John opened up a control unit in a commercially available GoDogGo ball throwing device and soldered in a one-eighth-inch jack, enabling the family to connect an oversize switch.

The GoDogGo, marketed as the world’s first “automatic ball launcher for dogs,” allows up to 15 tennis balls to be placed into a large bucket and fired singularly or in bursts, operated via a remote control – which was modified to accept a large switch.

“I was there for the first trial,” said John. “The

dog had no clue about what to expect, but the first time the ball launched, that dog did not hesitate. It got the ball and brought it back.

“The mother of the child told the dog where the ball went. The dog is trained to put the ball back in the launcher. The dog knows his part, and the boy knows his part, and they have a good time together.”

He said the boy can now go out to play with the dog independently of his parents.

Another family project John has recently completed was a bike trailer that enables an 11-year-old boy with cerebral palsy to be included on family cycle trips.

Essentially, it involves the addition of a wheelchair seat to a bike trailer to provide more upper body support. However, as these trailers are designed for younger children, the challenge was paring weight from the design.

“I used a basic bike trailer,” he said. “We stripped down the outside because most of the weight is in the fabric. We used plastic. We took the trailer down to nothing. It was a skeleton. We used the trailer for the axle.”

The finished product looks more like a wheelchair than a bike trailer, but it can be easily disassembled to fit in the trunk of a car.



DOG GONE: TETRA BALL LAUNCHER.

“If they can take it more places, they will use it more,” explained John.

“For that same boy we did a Wii remote modification so he can play with his family,” he continued.

“He had enough large motor skills to use the controller, but could not switch the buttons. We modified it so he can use a

sip ‘n’ puff to activate the buttons, while also using arm movements.”

Again, the controller was opened and a jack was added to the switching circuit so a variety of other options could be used, as required by the family.

“It’s fun when someone wants to be able to do something that’s recreation orientated,” added John. “I could not imagine life without recreation.”

When high-tech solutions need a little low-tech know-how

CALGARY: Technology can be a great leveller for people with disabilities – but sometimes it can benefit from some traditional engineering knowhow.

High-tech gadgets and devices are opening a new world of mobile communications and entertainment for everyone, but in particular they can be a lifeline for people with disabilities. People who struggle to hold a book, let alone turn the pages, find the modern portable readers much more controllable.

But not necessarily perfect. This technology can be challenging for anybody with restricted arm and hand function. That's where Tetra comes in. Low-tech, custom devices make Kobo and Kindle e-book readers, iPads and cell phones more accessible.

To that end, Calgary volunteer Brian Graham has created a functional and elegant holder for a Kobo.

The client, who has severe multiple sclerosis, has no arm movement. She's an avid reader who used to use a plastic book holder, requiring her to "find people to ask them to turn the page for her," said Graham.

Another Calgary volunteer created a mechanism that allows the client to advance text in the reader – head switches attached to her wheelchair send a signal, via a custom cable connection, to control the device.



When Graham came to create the holder to position the reader at the correct angle on the client's wheelchair tray, he was initially concerned that he didn't have a strip heater to bend Plexiglas. But he knew he could steam-shape laminated wood.

"I made the form, and steamed and bent the veneer over that. There is a tight radius, half-an-inch diameter curve on the outside, and three-eighths of an inch on the inside. It's a tight curve around the book reader.

"It's made in two parts. There's the part that goes around the book reader, and the piece that forms the base. It holds up very well."

Graham made a prototype which then led him to create an improved model that holds the reader at a more comfortable angle and includes an arm to support the cable. He even carved a Tetra logo on the holder.

His holder was one of the winning entries in a Summer 2011 Southern Alberta Woodworkers Society competition, being accepted by the technical standards committee for public display during a September wood-working exhibition in Downtown Calgary.

VANCOUVER: A simple wooden frame enables a Surrey, BC man to use his iPad in comfort.

Caspar Ryan, 27, finds an iPad much easier to hold than a book. His joints have a very restricted range of motion, as his body did not fully accept a lifesaving childhood bone marrow transplant. All the same, his wrists and elbows are not flexible enough to hold an iPad comfortably.

"An iPad is easier to hold than a book," he said. "It's built for reading and writing. Writing with a pen and paper can be extremely stressful for my wrists.

"The iPad allows me to go to online libraries and find a book. I read a lot of fiction, but also theology, and now and again I'll get a book on computer systems and technology. I even listen to audio books on it.

"Because of the limited manoeuvrability of my wrists, I cannot hold a book at the right position. I need to lean it on something."



TECH SUPPORT: A LITTLE TETRA ENGINEERING KNOW-HOW CAN MAKE HIGH-TECH PRODUCTS MUCH MORE ACCESSIBLE. SEEN HERE ARE: A SUPPORT FOR AN IPAD (ABOVE); A WHEELCHAIR TRAY DESIGNED TO HOLD A KINDLE READER AND A CUP-HOLDER (TOP OF PAGE); AND A HOLDER FOR A KOBO E-BOOK READER.



READ IT HERE: WHEELCHAIR KINDLE HOLDER.

Caspar, a videographer, realized that he was struggling to hold his iPad when using it for a presentation for a group interested in having a video made – he figured that if he had a holder made, he could see both the device and his audience.

He contacted Tetra, and while talking to volunteer Dave Doman, it became apparent an iPad holder would allow Caspar to read more comfortably wherever he was – particularly in bed or on his sofa.

Dave's wood and metal gizmo hooks over Caspar's shoulders and holds the iPod securely at arm's length. The height and angle of the screen can be adjusted for comfort, "just like a laptop," explains Caspar.

"Because of the device, the technology aids me rather than encumbers me. It does all the moves my wrists are not able to do. I find I'm using my iPad more and more for reading and writing. It's more accessible than a laptop."

VERNON: While book readers are ingenious technology, Tetra clients may well wish to mix them with other devices and activities.

Randy Schellenberg, a volunteer with the Vernon, BC Tetra chapter came up with an ingenious wheelchair tray to alternately hold a Kindle reader, laptop, cup-holder or a plate.

Client Frank Novakowski, of Kelowna, who has ALS – also known as Lou Gehrig's Disease – wanted a multi-function tray that also fits into a backpack on the rear of his chair. Schellenberg's solution was to shape aluminum tubing that screws into the ends of the armrests and hold two small tables that can be locked at different angles with push buttons. Attaching one of these tables backwards brings items even closer to the client.

"It's very simple, but it means he has one table for his cup, and one for his kindle," said Schellenberg. He wanted a quarter-inch square lip so his plate will not slide off.

"He can set both trays to the same level to use his laptop."

The client operates his Kindle reader and laptop via a sensor in a headband, which gives him independence, he added.

TETRA ROUND-UP



URGENT DELIVERY: PAUL GAUTHIER SHOWING OFF HIS WHEELCHAIR BABY CARRIER, SHORTLY BEFORE THE BIRTH OF BABY MATTEO.

VANCOUVER: Tetra volunteers created a wheelchair-mounted baby carrier.

The client, Paul Gauthier, wanted to transport his newborn son, Matteo, on his wheelchair. Vancouver volunteers used a car seat baby carrier that mounted, via an aluminum tube, to the footrest of Gauthier's chair.

Matteo, who has just turned one year old, has outgrown the carrier.

COMMUNICATION SHAKEDOWN

The internet offers a whole new level of communication, and, with that in mind, Tetra is operating a forum and a Facebook page.

Both are linked from the homepage of the Tetra website: www.tetrasociety.org.

"It's giving people another way to contact Tetra and find out about our life-changing assistive devices," explained Tetra national program coordinator Pat Tweedie.

"We want clients, volunteers and coordinators to come together and communicate. It's giving people more opportunity to find out about Tetra, and to share inspirational ideas online."

HELP US TO HELP

Tetra is a registered charity – and needs your help to continue assisting people with disabilities live independent and fulfilling lives.

If you – or someone you know – can make a donation to Tetra, please check out the orange *How you can help us* box on the Tetra website homepage (www.tetrasociety.org).

Donations are tax-deductible.

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

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