gizmo

THE TETRA SOCIETY OF NORTH AMERICA: CUSTOM ASSISTIVE DEVICES

Community support is ramping up

FREDERICTON: Tetra volunteers are at the heart of a community-wide process that is making boccia and bowling ramps available for people with disabilities.

These ramps enable people with significant disabilities to socialize, compete and gain the benefits of playing inclusive sports. Some participants have enough hand function to roll the bowling or boccia balls down the ramps, some use a head-mounted stick, and others give instructions to an aid who has their back to the game. Disability is no barrier to participation in these sports.

Ability New Brunswick asked Fredericton Tetra chapter coordinator Christine Plourde to produce four bowling ramps in February 2011 and then four boccia ramps that May.

Then this past January, the Para NB program — a partnership of area sports and disability groups — asked Tetra for 10 more ramps, five of each. At the same time, Tara House Community Youth Services in Sussex, NB, came forward with a request for two more boccia ramps.

All of these 20 ramps are regularly used by dozens of participants throughout the community.

"My husband Luc is a teacher at a local high school, so I asked him if they would like to help," said Christine. "The projects were completed as a partnership between two of our Tetra volunteers and the woodworking class at Leo Hayes High School in Fredericton.

"Luc and his class created the wooden portions of the ramps, then Tetra volunteers Jonathon

BALL BOYS: TESTING ONE OF TETRA'S BOCCIA RAMPS, CREATED BY THE COMMUNITY FOR THE COMMUNITY.

Dueck and Dan 'Goodie' Gaudet sourced the parts for the metal stands, cut and welded the parts and assembled the two parts of each boccia ramp.

"Dan is a former volunteer, and agreed to help out on this project as he has metal working and welding abilities in his home workshop. Jon is an active volunteer and helped to source the materials, picked up the wooden ramps from the school, assembled the metal and wooden parts and delivered them to the client."

In April, Jonathon Dueck involved the Cub Scout group where he also volunteers in the assembly process — adding another community group into the mix.

"I am always looking for ways the Cub Scouts can perform community service," he said. "I thought this would be a great combination. The youth would be able to learn new skills by assembling the ramps and once the ramps were assembled they could test them out by learning and playing boccia."

The demand for the ramps follows an upsurge in interest in boccia and bowling inspired by a series of disability sports workshops held throughout the area. Para NB manager Courtenay Brennan described a recent event as involving "seniors, kids, able-bodied people that came with people with disabilities. . . they were all playing boccia against each other — the disabilities did not matter."

The ramps made by Tetra are being used in sports workshops to give people an all-important positive first experience of the sport, and are also available for day-to-day use through an innovative adaptive sports equipment loan service.

Christine Plourde added that she is impressed at how many individuals and community organizations have come together to create opportunities for people with disabilities to play sport. "We had two groups of young people working together, in addition to Tetra, on a project for another community group."

Wii will rock you

SALT LAKE CITY: An increasingly popular request made of the Tetra Society of North America is to make games controllers more accessible. • Although the Wii system responds to motion and can be strapped to the arm of someone with limited dexterity, the controller relies on two small buttons that pose problems for people with disabili- ties. However, by wiring in leads with jack plugs, a range of plug-and-go switching options can be given. • "We learned early on to make these adjust- able or make them again," said chapter coordinator Kent Remund. "These are great projects—we've done six of them — although other people are doing this throughout America. We get a lot of enjoyment from seeing the client, particularly children, play with a friend or sibling rather than having to be an ob- server." • Their latest Wii project was for a Kelowna, BC, man.

Wash and go independent

Tetra offers real life lessons to engineering students

CALGARY: A Tetra volunteer needed to find a way to allow a teenage girl with limited arm function to shampoo her own hair.

It may not sound like a huge deal, but when you need assistance to wash your hair, you lose privacy and independence. This is important to anyone, but particularly to teens.

In this case, the client is a 13-year-old girl who has arthrogryposis — a condition that causes joint contractures — and was also born without a left hand. She was able to shower herself, but not shampoo her hair.

So Tetra Calgary volunteer Brian Graham devised a structure that called for soft nylon pads that offer enough grip to allow her to wash her own hair and back. He just needed to find the right components.

CHANCE OF SHOWERS: TETRA DESIGNED THIS SELF-CARE AID.

"I was trying to work out a design, and told a friend what I was looking to build — a device with soft, rubbery fingers — and he suggested something people use to groom horses, a curry comb," Graham said. "They were just the kind of thing I was looking for.

"I had a bit of concern, so I made sure the client was aware that I was thinking of using curry combs. She said she didn't care that they were also used to groom horses."

The completed project houses three such combs in a specially shaped length of clear Plexiglas, which is itself attached to a vertical grab bar for height-adjustment purposes. He fabricated the device using a strip heater in Tetra's fully-equipped Calgary workshop, which opened in February 2012.

Graham has been a Tetra volunteer for two years, completing his first project, wheelchair rear-view mirrors, in March 2011. Typically, the projects that come to him involve woodwork, which is his passion, but he has put his name to a whole range of innovative Tetra devices.

ST JOHN'S: Students are learning hands-on engineering basics through innovative partnerships between universities and the Tetra Society.

It's win-win for everyone involved: Students get a challenge they can relate to; people with disabilities receive custom inventions that help overcome day-to-day challenges; and the Tetra Society becomes more sustainable, inspiring a whole new future generation of volunteers.

It can all be traced back to the man who has been running the St. John's, NL chapter since 1996. Dr. Leonard Lye, associate dean of the faculty of engineering and applied science at Memorial University, has involved his students in Tetra projects from day one.

Dr. Lye fabricates the simpler Tetra devices in his basement on Sunday afternoons, but anything that poses a suitable challenge is used to test his students. He has completed scores of projects over the years — "I stopped counting at 60," he claims — and earlier this year was awarded Memorial University's Glenn Roy Blundon Award for fostering an accessible learning environment for students with disabilities.

Two years ago Dr. Lye published a paper, *Incorporating Real-Life Open-Ended Design Projects in a First Year Design Course*, which has been inspiring engineering departments around North America ever since. Presented at the 2011 Canadian Engineering Education Association Conference, it details his students' involvement in Tetra projects, and how these pose a more "real-world" challenge than right-or-wrong textbook exercises.

His group most recently completed a walker project for an 80-year-old man, "who comes in to chat to the students every month." Upcoming challenges include fabricating a device to help someone transfer to a pool wheelchair, and devising an off-road-capable wheelchair for an 11-year-old boy, who needs a reclining position.

However, it was a project completed late 2012 that got the young engineers featured in the provincial legislature. Dr. Lye, with students Chris Tubrett, Adam Scammell,

ACCESS ALL AREAS: TETRA'S DR. LEONARD LYE ACCEPTING THIS YEAR'S GLENN ROY BLUNDON AWARD FOR FOSTERING AN ACCESSIBLE LEARNING ENVIRONMENT FOR STUDENTS WITH DISABILITIES AT MEMORIAL UNIVERSITY.

Anthony Parrell, Evan Rice and Jon Bennett, visited the House of Assembly of Newfoundland and Labrador for December's International Day of People with Disability.

This was for creating a guitar stand that allows a 20-year-old St. John's woman with cerebral palsy, Kirsty Lynn March, get the most from Easter Seals music therapy sessions. Previously, someone had to hold the guitar at the correct height and brace themselves against Kirsty occasionally pushing the guitar or pulling at the strings.

Dr. Lye's engineering students were challenged to come up with a roll-under device that needed to be "versatile, stable, simple and easy to use" and would not dampen the sound of an acoustic guitar. The winning design team then had to overcome a last-minute glitch when Kirsty broke her dominant left arm, having one week to adapt the project to allow for right-handed play.

"Many groups of students attempt to devise a project, and I pick the one with the most practical design," explained Dr. Lye. "The teams visited Kirsty and saw her in action — they were inspired by the thought of doing something useful. That thought really motivated them.

"And when the project was completed, seeing her play guitar was great. She can express herself."

The reward, as the participating students found, is in making a difference.

The Tetra Society is currently involved with numerous North American universities, which have supplied expertise and problem solving initiatives.

- University of British Columbia, Vancouver, BC
- University of Calgary, AB
- University of Regina, SK
- University of Saskatchewan, Saskatoon, SK
- University of Western Ontario, London, ON
- McMaster University, Hamilton, ON
- University of Toronto, ON
- Queens University, Kingston, ON
- University of New Brunswick, Fredericton, NB
- Memorial University, St John's, NL
- Colorado State University, Fort Collins, CO,
- California State University, Long Beach, CA

Runnin' back to Saskatoon

SASKATOON: Second-year University of Saskatchewan engineering students tackled a problem that is familiar to any wheelchair user who needs to carry things.

The only space for a backpack or similar sized bag is on the back of the chair, where it is effectively out of reach for the average occupant.

This came about after mechanical engineering instructor Rick Retzlaff contacted Tetra national program coordinator Pat Tweedie last October to request a suitable challenge to use in his Introduction to Engineering Design class. Tweedie suggested that Eric Molendyk, who also works at head office in Vancouver, BC, was looking for a way to independently load and unload his wheelchair backpack.

In January the students formed 18 groups that competed to design and fabricate a prototype backpack retrieval device. Molendyk provided a video and a Skype Q & A session.

"The project really provided a lot of motivation for the students," said Retzlaff. "In the past we've had projects that were quite abstract, involving a ball bearing in mining equipment, but this was a real problem that affected someone's life."

Retzlaff was particularly keen for a hands-on fabrication component to teach "accountability in design," and this project had the added interest in being something the students could relate to, in addition to being more realistic than the average learning exercise, especially as there is more than one solution. He provided his students with materials and a little advice, then stood back to watch.

He said most designs involved a "swing arm," but some involved pulleys and even drawers under the seat of Eric's wheelchair. Three-quarters were either unbuildable or unworkable," he noted.

"Engineering students love solving prob-

ERIC'S GOT A BRAND NEW BAG: ENGINEERING STUDENTS MAKING THEIR WHEELCHAIR BAG PRESENTATIONS.

lems — often problems that don't exist. You have to tell them what a problem is. Some students came up with stuff that was impossible for Eric to use because they didn't pay attention to the video or ask the right questions of him.

"They learned a lot from this — for a start, nobody attempted to quantify Eric's range of motion, although some were smart enough to send Eric a list of questions."

Eric flew out to Saskatoon in late March to test the prototypes and help pick the best two, which, after a little more work, will be completed by early June.

Also visiting for the prototype-testing was Tetra's new Saskatoon coordinator Taukeer Ashraf and volunteers from Regina. Ashraf, an engineer with energy company AMEC, formed the chapter late last year around a core of seven volunteers.

"In my second-year design class my project meant nothing to me," he recalled. " We were talking about protecting people from impacts at high-speed skating rinks. It was just something to do.

"These students started off saying they wanted to do something meaningful. If I was at university, I'd want to do something like this."

Tetra campus clubs

TORONTO: While Tetra is working directly with university engineering departments, the organization also has student-led clubs at a number of Canadian colleges and universities.

The idea is to have students building devices for other students, creating self-sustaining groups that make campuses more accessible and more inviting to potential students with disabilities. These groups are working closely with the engineering departments to get these projects devised and created.

Currently eight colleges and universities in Ontario's Greater Toronto Area and Peel Region are involved in this Tetra "Youth in Transition" project, made possible through a grant from Ontario's Trillium Foundation.

Biomedical engineering student Andrea Pagotto is co-president of the 30-strong University of Toronto's Tetra Devices for Disabilities Club, which in February ran a competition to get all students thinking about campus accessibility.

"We invited people to look at campus facilities and see what could be improved, or to talk about general issues," she said. " The idea was to get more people talking about accessibility and equal access to education."

STARTING ON THE GROUND FLOOR

OPENING ACT: TETRA'S FLOOR-LEVEL FRONT-OPENING CRIB.

TORONTO: It is a common enough request to modify a crib to have easy-access side opening doors, but in this case the mother-to-be was fearful of dropping the newborn.

In engineering, the simplest solution is most often the best. So the Toronto Tetra volunteers removed the legs from the modified crib so it is placed on the floor. Mom, who has cerebral palsy, sits to interact with baby.

"The mother walks, but does not have great balance, and, after talking to her, we found it would be easier for her to sit to interact with the child," said chapter coordinator Richard Chui. "There is a real need for adaptive cribs."

Cribs are notoriously inaccessible for people with disabilities, as the side door is hard to disengage and does not lower far enough to allow people with impaired mobility to reach in. Tetra receives many requests each year for crib doors that open in some other way.

Volunteer Ron Sidon explained that he assembled three sides of the crib, with the front cut in half so it swings open as two doors. He fixed aluminum reinforcing rails to keep it all in place, with childproof latches top and bottom.

He cut 11.5 cm (4.5 inches) off each leg so the crib was as low to the ground as possible while still allowing the door to open.

Chui has been chapter coordinator since last October, working with around 18 other volunteers. This was the third children's project the group has completed this year, which also includes a wheelchair baby seat, for a different client, and a child's wheelchair iPad holder. Their next will be a modified tricycle.

TETRA CHAPTERS

Abbotsford/Mission, BC
John Connor
info@tetrasociety.org
604-820-0568

Armstrong, BC
Gary Arbuckle
garbuckle@shaw.ca
250-546-6449

Cranbrook/ East Kootenay, BC
Russ Kinghorn
Russ.Kinghorn@
kinghornsystems.com
250-426-2158

Creston, BC
Andre Hebert
kayaker2@telus.net
250-866-5518

Fort St. John, BC
Perry Leonfellner
leonfellner@shaw.ca
250-264-2192

Kamloops, BC
Ralph Adams
tetrakam@telus.net
250-828-0558

Kelowna, BC
Ean Price
Ean250@gmail.com
250-863-0650

Nanaimo, BC
Contact head office
info@tetrasociety.org
1-877-688-8762

Prince George, BC
Contact head office
info@tetrasociety.org
1-877-688-8762

Prince Rupert, BC
Contact head office
info@tetrasociety.org
1-877-688-8762

Salt Spring Island, BC
Derek Emmerson
demmerson@shaw.ca
250-537-9351

Trail/Castlegar, BC
Jim Rees
jmrees@shaw.ca
250-364-1878

Vancouver, BC
Pat Tweedie
ptweedie@tetrasociety.org
1-877-688-8762

Vernon, BC
Randy Schellenberg
randy@quickturnmachine.com
250-549-2320

Victoria, BC
Pat Tweedie
ptweedie@tetrasociety.org
1-877-688-8762

Whistler, BC
Hugh Tollett
info@whistlerforthe
disabled.com
1-877-688-8762

Calgary, AB
Stephanie Coupal
tetracalg@yahoo.com
403-803-9214

Edmonton, AB
Contact head office
info@tetrasociety.org
1-877-688-8762

Lethbridge, AB
Chris Schamber
hatesnow@quaddesign.ca
403-381-7450

Medicine Hat, AB
Maxine Tindall
tinker046@hotmail.com
403-488-1322

Red Deer, AB
Jim Stone
jstone05@telus.net
403-438-0172

Regina, SK
Terri Sleeva
tetraregina@sasktel.net
306-545-7378

Saskatoon, SK
Taukeer Ashraf
tetrasaskatoon@gmail.com
1-877-688-8762

Winnipeg, MB
Contact head office
info@tetrasociety.org
1-877-688-8762

Guelph, ON
Leanne Conrad
tetraguelph@gmail.com
1-877-688-8762

Hamilton-Halton, ON
Sylvia Baliko
sbaliko1@sympatico.ca
905-319-2843

Kingston, ON
Tian Lu
8tl2@queensu.ca
1-877-688-8762

London, ON
Wilma McIntyre
tetralondon@rogers.com
519-453-5005

Ottawa, ON
Sarah O'Connor
sarahaoconnor@gmail.com
613-262-3396

Peel Region, ON
Matthew Fleet
Matthew.fleet@sympatico.ca
905-814-8789

Metro Toronto, ON
Richard Chui
richardchui@hotmail.com
647-786-8557

York Region, ON
Contact head office
info@tetrasociety.org
1-877-688-8762

Trenton, ON
Gary Richard
garyrichard50@hotmail.com
1-877-688-8762

Windsor, ON
Sharon Lumsden
windsortetra@sympatico.ca
519-735-8763

Montréal, QC
Contact head office
info@tetrasociety.org
1-877-688-8762

Fredericton, NB
Christine Plourde
cplourde@craworld.com
506-462-7662

Halifax, NS
David Beattie
tetrahalifax@ns.sympatico.ca
902-860-1995

St. John's, NL
Dr. Leonard Lye
llye@mun.ca
709-753-0733

Los Angeles, CA
Dr. Sam Landsberger
slandsb@exchange.calstatela.edu
1-877-688-8762

San Diego, CA
Contact head office
info@tetrasociety.org
1-877-688-8762

San Francisco, CA
Contact head office
info@tetrasociety.org
1-877-688-8762

Salt Lake City, UT
Kent Remund
kremund@gmail.com
801-448-6107

Columbus, OH
Russ Weir
weir.russ.linda@att.net
1-877-688-8762

TETRA SOCIETY OF NORTH AMERICA

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

Here's how to reach us...

T: 604-688-6464 / 1-877-688-8762 (toll-free)
F: 604-688-6463
E: info@tetrasociety.org
www.TetraSociety.org

Tetra Society of North America Suite 318 - 425 Carrall Street, Vancouver, BC V6B 6E3