DEPARTMENT OF VETERANS AFFAIRS

PM&R ASSITIVE TECHNOLOGY PROGRAM

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Richmond Expanding Bike Trails to include Handcycles ...April Mizell, CTRS

It was an idea born out of necessity. Wayne Goodman is an avid outdoors enthusiast who suffered a freak mountain bike accident about two years ago that left him with limited use of his hands and legs, due to an incomplete spinal cord injury. Before his accident, Wayne was instrumental in helping to build the popular James River Park System trails that stretch along both sides of the river from the Boulevard Bridge to downtown Richmond and across to Belle Island. Not one to slow down due to his injury, Wayne envisioned a new type of trail that could be ridden with hand cycles or "trikes" that are commonly used by people who have suffered paralysis or amputation.

Using his network of

mountain bike friends, Wayne contacted his long time friend, Greg Rollins, about the idea. Greg is the former president of Richmond MORE (Mid-Atlantic Off-Road Enthusiasts), which is a local non-profit trail building and advocacy group in the Richmond area. From there, the idea was quickly set into motion to build a set of trails that gives access to all off-road cyclists regardless of their equipment type.

Pocahontas State Park in Chesterfield County, VA was the obvious choice for the location because of the existing amenities within the park and over 8,000 acres of land that is available to build such a network of trails. Another non-profit organization, the Friends of Pocahontas State Park, will be working in conjunction with Richmond

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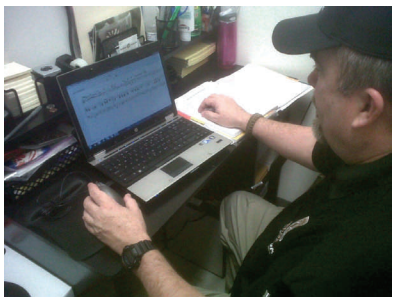
Veteran's Story...Bill Bjornes



Bill Bjornes is a 50 year old veteran who served in the Air Force as a trumpet player for the Air Force Brass Quartet. He was diagnosis with Hashimoto's encephalitis in 2009.

Mr. Bjornes was referred to the PTRP program and then the PNS for rehabilitation and it was in those programs he was referred to the AT Program.

Tell us about your experience with the AT Program.

I've benefited from all of the clinics in the AT Program, especially RT and AT.

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Handcycles, cont.

MORE to help spearhead and complete the project. Other supporters of the project include the Paralyzed Veterans of America (PVA) Mid-Atlantic Region, Pocahontas State Park, The Virginia Department of Conservation and Recreation (DCR), the Governor's Office for 2015, Sportable.org and The Mobility Supercenter of Richmond.

The trails will be designed as a series of loops with varying difficulty and a total length of five to six miles. They will emulate traditional off road mountain bike trails to give users a unique opportunity to explore the park and create an outdoors experience for many who may have never had this type of access. A grant of $50,000 by the DCR has already been established to start the project and more funding is being sought to help build additional amenities in park to accommodate the trail users. Groundbreaking on the project is expected to start in late summer of 2013.

Meet McGuire's AT Team ...April Mizell, CTRS

April Mizell, CTRS

April Mizell is a graduate from Virginia Commonwealth University where she earned a degree in Recreation, Parks, and Sport Management with a concentration in Therapeutic Recreation. She became a Certified Therapeutic Recreation Specialist in 2007.

Learn more about April:

How long have you been at the VA?

I have been at the VA for 4 ½ years. I have worked on both the Community Living Center and Spinal Cord Injury and Disorders unit.

What do you like about working at the VA?

The VA offers so many opportunities for our patients. We are able to get certain equipment for our patients once they have shown interest in an activity, which improves their quality of life and helps them to live a more active lifestyle.

What areas of AT are you interested in and like working with? And Why? Why are you passionate about AT?

I am most interested in adaptive sports. I like having the opportunity to show patients that they can still do sports even with their limitations. We are fortunate here at the VA to have a lot of adaptive equipment available for our patients to trial, which is sometimes all it takes to get them hooked. It's amazing to see how sports can make a person feel, especially after an injury. It allows them to focus on their abilities rather than their disabilities. I really enjoy w/c softball, basketball, and skiing.

Tell us about other interests outside of the VA.

I enjoy spending time with my family, especially my little boy who is almost 5 months old. I also enjoy traveling, going to baseball games, kayaking with Hank (my dog), and beating my husband at board games.

Veteran's Story, cont.

What challenges were you having that resulted in your referral to the AT program?

Hashimoto's Encephalitis has several secondary issues that interfere with daily life. I don't experience time, seldom know what day or time it is, get confused easily, have organizational issues, and have experienced changes in how I learn new things.

Who did you see?

For AT I was seen by Melissa Oliver. For RT, Nicole Shuman and April Mizell. They all deserve big raises.

What devices did you receive?

I received an Ipod Touch, Evoluent upright mouse, stylus, Kurzweil 3000 and Speak & Write along with an incredible amount of help with coping strategies from Melissa Oliver. I still remember the anxiety & stress of giving up my 3 paper calendars in order to start using the scheduling capabilities of the Ipod. Melissa provided excellent instruction on the Ipod, as well as support and guidance while I pegged my stress meter.

How has this device changed your life?

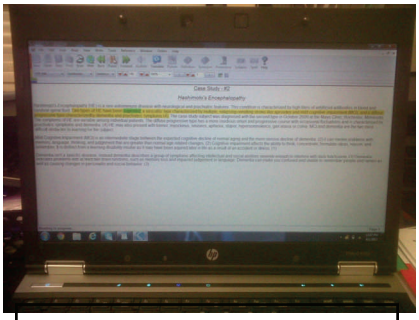
I don't know where to begin. My confidence has increased, I am doing very well taking 2 courses online through the Berklee School of Music, I'm working part time, I can manage my daily schedule, my communication skills have improved, my ability to quickly take notes is better, cross referencing data for my part time job is more efficient, life in general is better and I only see it improving.

What activities are you doing now that you were not able to do before?

I am going to school, working part time, being more social, and competed & won a position on the

Mr. Bjornes at Work using iPod Touch

USAF Warrior Games shooting team. The Ipod allows me to generate shopping lists and scan bar codes while shopping. It also helps me by giving me something to focus on, allowing me to spend less energy scanning the people around me as I don't like crowds or being in an aisle that's blocked at both ends. I can take pictures of book covers and things that interest me to check out later. I use the Ipod when I am training for the Warrior games to take notes and also take pictures of targets, proper form and the range environment. If I enter an outdoor distance shooting event I can store my ballistics table and shooting information for the particular rifle that's being used at the event in addition to pulling up



Kurzweil Program

current weather data.

The Kurzweil program enables me to succeed at school work. I learn quicker and retain more when the program reads the coursework to me as I read along, or as I watch the example on screen. I also use it to read articles online to absorb more of the content quicker.

I work part time at Brigade Quartermaster as a sales associate selling technical and tactical gear to the military, law enforcement and shooting communities. I learn about our products on the 3.5.com training website. A combination of video, text & still photos are used to help sales associates better understand the products. Using the upright mouse enables me to maneuver through the web based training easier. Kurzweil allows me to study the product diagrams as the text is read to me. My manager and workplace advocate, Jennifer Barnett has helped create an environment that helps me learn and has systems in place (checklists!) that enable me to contribute to the success of our branch. I am way more confident on the work floor having used Kurzweil to learn about the products we sell.

Would you say you quality of life has improved?

My life has greatly improved and I give a lot of credit for that to AT and Melissa Oliver. Also include the great staff at the VA PTRP/PNS program and Dr. Sharon Funari.

Is there anything we have not covered that you would like to include?

I enjoy life a lot more now. There's still a long way to go, but I'm going to get there. With all of the help, coping strategies and AT I've received I've gone from being at the VA 5 days a week to 2 days a week and can function better on my own.

Electronic Aids to Daily Living (EADLS)

...Brian Burkhardt, Rehab Engineering

For centuries humans have used intellect and ingenuity to adapt our surroundings to better suit our survival needs and comfort. From simple beginnings of stone tools and the discovery of fire, we have built vast cities full of conditioned ergonomic spaces catering to our needs and desires. Electronic Aids to Daily Living (EADLs) are a modern variant of this adaptation process as it applies to enabling access to the world of electronics and electrical devices to individuals who cannot access the standard controls. Imagine not being able to check your email without the help of a caregiver, or simply not being able to turn on a bedside light. EADLs provide a means for individuals to interact with devices in their environment to achieve personalized goals relating to quality of life, independence, and safety. EADL is a relatively new term for what was previously referred to as an Environmental Control Unit (ECU). The name was changed to more accurately reflect the purpose of ECUs and to relate these products to similar devices like Aids to Daily Living (ADLs), which are more widely approved by private funding sources.

This area of assistive technology encompasses a diverse set of products ranging from remote light switches to custom voice activated home automation systems. The heart of any EADL system is the user. The process of building an EADL system around a user starts with a few questions. What are the goals of the user and how do these translate into specific device control options? What physical and cognitive ability does the user poses and how do these translate into a viable human technology interface. Finally, is the user comfortable with technology? Answering these questions sharpens the focus of the evaluation process and helps select the best technology to best achieve the user's goals.

Most individuals desire access to a telephone, television, lights, fans, and

doors. The complexity of the EADL system dictates the available device control fidelity and the quantity of devices under user control. Each device category requires different control interface technologies, each having advantages and disadvantages. One of the most common environmental interface strategies is based on home automation systems, X-10 or Insteon, that control lights, doors, thermostats, and other electro-mechanical devices in the home. Another common interface method uses universal infrared (IR) remotes which control televisions and home entertainment equipment. The growing ubiquity of home wireless networking, WiFi and Z-wave, makes this a viable interface option for device control and is quickly becoming normal in consumer electronics. It is common place to find WiFi connected thermostats and garage door openers in any home improvement store. This level of connectivity is slowly working its way into the EADL world and will likely eventually replace other antiquated systems.

The human technology interface in EADL systems consist of a control interface or access method, and some sort of user display or user feedback. Selection of the control interface should be based on user abilities, preferences,

and actual device trials. User control can be accomplished directly or indirectly. Direct control is most efficient and involves the user making specific selections at will with a finger, hand, eye, or voice. Examples of direct selection include joystick mouse control or voice activation. Indirect control is less efficient, but allows a simple physical interface for individuals who have very limited functional mobility. While more simple physically indirect selection requires a more complex multi stage selection process. To better picture indirect selection imagine trying to turn on and off three separate lights in your home with only one light switch. Scanning is the indirect selection process that answers this conundrum. There are many types of scanning, but the most basic implementation requires one switch that upon the first activation initiates a prompt moving through available options and upon a second activation selects a specific option. In this description indirect selection requires two steps while direct selection would only require one step.

EADLs, following the consumer electronics trend, is constantly

changing with the advancement of technology and in response to user requirements. With the growing variety of mobile, computationally powerful, and connected personnel computing devices, like the iPad or Samsung Galaxy tablet, options for EADL systems are growing rapidly. Many Apps and hardware accessories are available for these devices that allow access home automation systems, televisions, and any other remote controlled devices. Additionally, multiple assistive technology companies are producing accessories that allow scanning access to these mobile devices. Only time will determine which of these products are successful in the consumer market and result in viable EADL systems, but the future looks very bright.

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Assistive Technology Program Mission

- To enhance the ability of Veterans and Active Duty members with disabilities to fulfill life goals through the coordination and provision of appropriate interdisciplinary assistive technology services.
- To serve as an expert resource to support the application of assistive technology within the VA health care system.

Nuts & Bolts of Rehab Engineering...

Google Glass and Potential Assistive Technology Uses

...Ben Salatin, MS

Project Glass as Google calls it is a research project developing an augmented reality head mounted display. The device is connected to a modified pair of glasses minus the lenses (Fig 1).

Figure 1

Glass displays data to the user via a semi transparent screen in the upper right corner of a user's vision (Fig 2). The screen overlay is positioned so that you have to look up and to the right slightly as it is intended to no block your straight forward vision. Glass has Bluetooth and wifi capabilities allowing it to connect with a user's smart phone or a wifi hotspot. The primary method of interacting with Glass is by voice (http://www.youtube.com/watch?v=v1uyQZNg2vE) via a small microphone and speaker. There is a high definition camera on the front of the glasses which can record video or take pictures from the user's perspective. Glass also contains a GPS chip for location tracking similar to smart phones. Glass it not yet available for sale but Google has projected the device will be on the market by 2014. Google hosted a contest to choose people who will have the opportunity to purchase a pre-release version of Glass for $1,500 sometime midyear 2013.

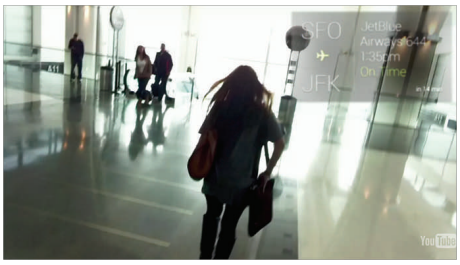

Figure 2

Many people are dreaming up creative ways to use Glass when it becomes available so I would like to offer some potential assistive technology uses that I have thought of based on my clinical experience.

- Completely hands-free wireless access to many features on a person's smart phone (calling, text messaging, email, social media, live video sharing).
  - Current Bluetooth headsets require a button press to activate the microphone so voice commands can be given. This is difficult to impossible for some people.
- Camera could do facial recognition of people and remind the user of the person's name and how the user knows the person.
  - This would be useful for user's with memory deficits.
- Display could provide video prompts with a demonstration to remind and show users with memory deficits how to do an activity.
- Personal and private display screen for alternative & augmentative communication (AAC) apps.
  - Currently the tablet computer which runs the AAC app must be carried or mounted in the user's line of sight.
  - Glass could use context such as: facial recognition, speech recognition, location, the user's schedule, etc to perform more efficient word prediction to increase utterance generation.
- Camera could recognize obstacles and prompt users with low vision to avoid them

There are still specifications that are not know about Glass which will add many more uses to the list above. It will be interesting to see how this technology is accepted into our society and the many ways that people find to use it. For more information check out these links http://www.google.com/glass/start/ and http://en.wikipedia.org/wiki/Project_Glass