

*Congratulations!*

The Tampa Assistive Technology Program successfully completed its second CARF survey in March along with 11 other rehabilitation programs at the James A Haley VA Hospital.

**Inside this issue:**

- AT Lab Highlights: Richmond 2
- AT Lab Highlights: Tampa and Minneapolis 3
- AT Lab Highlights: Palo Alto 4
- Veteran's Story 6
- Tech it Out 7
- AT Educational 8

AT Newsletter Edited by:  
Melissa Oliver, MS OTR/L  
Richmond AT Program

# PM&R Assistive Technology Programs

Volume 3, Issue 1

Spring 2014

## Creating New Solutions through 3D Printing

**Ben Salatin, AT Rehab Engineer**

3D Printing, a fast growing high tech prototyping and manufacturing method has found a home in the clinical rehab environment at the Richmond VAMC. The Assistive Technology Program acquired a 3D printer and has put it to use as part of its clinical services. Using SolidWorks commercial 3D modeling software and their Stratasys 3D printer, rehabilitation engineers Ben Salatin and Brian Burkhardt are creating custom solutions for veterans (Fig 1).



Figure 1—Ben Salatin

In the preparation for a communication device evaluation the next day, a speech language pathologist needed a keyguard for an iPad communication app because the Veteran had some hand tremors. The AT program did not have the keyguard she needed but by the next day, rehab engineer Ben Salatin was able to design a keyguard and 3D print it overnight for the Veteran's appointment the next day (Fig 2).

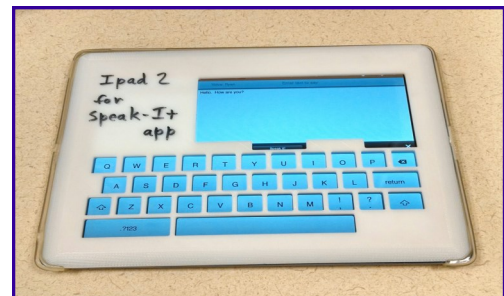


Figure 2—iPad KeyGuard for a Communication App

In a second case, a Veteran with a spinal cord injury could not change the orientation of the smart phone mount on his new wheelchair due to his limited hand function. Rehab engineer Ben Salatin designed a solution for the mount which allowed the veteran to change orientations with no hand functions (Fig 3). The Veteran is currently using version 2 after it was redesigned to be more robust and simpler (Fig 4) (continued on page 5).



Figure 3— Version 1

## AT Lab Highlights...Richmond



AT Expo



### AT Program Hosted an AT Expo

The Richmond Assistive Technology Program hosted an Assistive Technology Expo in October 2013 which featured vendors and Veteran agencies that specialize in various areas of assistive technology. The AT Expo was open to all VA staff as well as the public to attend. There were over 30 vendors and over 100 attendees.

The AT Expo offered an opportunity for rehabilitation therapists, other medical providers and Veterans to have hands on experience with various types of AT devices. In addition, there were state agencies in attendance to educate the communicate about AT Veteran services available to residents of Virginia.

### AT Professional Development

The AT Program is providing monthly AT in-services to all rehabilitation staff on various topics of Assistive Technology. Topics have included: Windows Accessibility Features, clinical application of 3D Printing, Basic use of smartphones, and App exchange.

The AT Program is also offering "APP" Education Sheets for clinicians to utilize with their Veterans while providing training. The apps are reviewed and tested by an AT staff member. The reviews provide app description, the cost, pros and cons as well as a basic screen shot.

### AT Expanding Services

The AT Program has set up the E-consult for interfacility consultative services opening our services to more therapists and Veterans.

### AT Community Outreach

The AT Program presented to the VISN 06 Veterans Advisory Council on AT services and its benefits for our Veterans.

## AT Lab Highlights...Seattle

Seattle is making good progress in establishing an Assistive Technology Clinic. We presented at Grand Rounds in December, to launch our campaign and educate providers on the benefits of having an collaborative approach to AT. Our interdisciplinary consult template and CPRS team documentation has gone live. We have also

been successful in developing templates in CPRS for the QUEST, FMA and ASHA NOMS, as well as supporting standardized assessments that will allow us to track data and health factors locally. This enables us to pull reports, monitor data and

participate in QI initiatives.

All our efforts have received the support of our Service Line and greater medical center, as we were recently granted a 12x20 lab space, wired for telehealth and conferencing. The lab will be equipped with demo carts for AAC, computer access, EADL/ECU, mounting systems, wheelchair modifications/customization and vision rehabilitation. We have just recently gained control of the space and look forward to filling out with all our resources.

We have 3 staff members on our team who are currently studying for their ATP and intend on taking the exam by the end of the year: Cathy Covey, MOTR/L; Laura

Hardy, MS, CCC-SLP and Virginia Kudritzki, DPT

We are looking forward to the PVA Summit this August- Our team will be presenting a platform on "Creating a Multidisciplinary AT Team". Hope to see some of your there!



Seattle AT Lab

## AT Lab Highlights...Tampa

### AT NETWORKING, EDUCATION AND OUTREACH

The Tampa Assistive Technology Program attended the Assistive Technology Industry Association (ATIA) 2014 Orlando Conference in which we were able to attend multiple educational sessions as well as network with other AT providers, vendors and manufacturers. Additionally, we were able to participate in a RESNA member committee meeting to discuss challenges, education opportunities and goal planning for future conferences. Members of the AT Program will be co-presenting on Communication Apps at the next scheduled Quarterly AT Training via online meeting in May. Moreover, we, along with several of the program's Track Champions, will be lecturing on Multi-Disciplinary AT Assessment as well as leading two breakout sessions for hands-on exposure with technology at The Association of Veterans Affairs Speech-Language Pathologists (AVASLP) National Conference also in April. Monthly educational opportunities are held for staff to include product demos and webinars. We continue to work towards increasing outreach to staff within our VISN as well as increasing access to tele-health services for our Veterans and

Service Members through the ongoing development of an inter-facility consult as well as e-consult.

### AT EXPANSION

We expect to move into our additional space in the new, state-of-the-art Polytrauma Major Building which is projected for completion this April. Fortunately, we were also recently able to obtain a separate, quiet treatment room near our main lab in the Transitional Building in order to provide uninterrupted and private service for our patient population.

### ATP CERTIFICATION

Richard Archer, Clinical Rehabilitation Technician for the Assistive Technology Program obtained his RESNA ATP certification in January.

### AT PROJECTS

**Patents** - The AT Program along with the Center of Excellence have filed for a provisional patent on a patient-controlled, motorized extendable/retractable, capacitive mouth stick. We are currently working on the final design of the mouth piece and imbedding photo sensors for the switch operations. The final prototype is nearly complete and we hope

to start testing soon.

**Get Well Network** – The AT Program is currently working with the Get Well Network as well as BioMed to develop a solution for alternative access to the network for patients who are physically unable to touch the screen. The QuadJoy and IntegraMouse have been tested successfully at this time. We are working on integrating the Quartet and Autonomie EADL devices with the GWN.

**Independent Living Apartment** – The Autonomie EADL system is now installed in the Spinal Cord Injury Independent Living Apartment. This addition allows patients who are transitioning to home the ability to train, practice and independently control various devices within the home such as a TV, bed or other appliances via a variety of access modalities.

**Smarthome** - The Smarthome system is now installed within the Spinal Cord Injury Independent Living Apartment. AT will be directly involved with Ubisense and the Center of Excellence to train clinicians on system implementation.

## AT Lab Highlights...Minneapolis

### TAKING A SECOND LOOK AT BRAIN-COMPUTER INTERFACES

Brain-Computer Interfaces (BCIs) typically consist of an EEG recording cap, an amplifier, a processing unit and a user interface. BCI developers have worked on providing access to typing, gaming and artistic software. Even though this technology has been under development for over 20 years, advances have come slowly. Currently, the typing software requires frequent use to maintain the ability to operate the BCI and typing rates are approximately 5-6 letters per minute. Such communication rates are among the slowest of all speech generating options.

Given these limitations, one

might reasonably ask why an individual would want to use a BCI. The answer requires understanding of the progression of degenerative diseases such as ALS. Individuals with ALS often lose the ability to speak and rely on AAC devices that are accessed using whatever motor ability the patient retains. This may include head or foot movement; eyeblink, EMG or Piezo switches; or eyegaze control. But for patients who lose all ability to produce voluntary movement, use of a BCI can provide a means, however slow, of communicating. The Minneapolis VA Medical Center is currently evaluating use of the Intendix BCI marketed by Cortech Solutions (see figure) in patients with advanced ALS.

In addition to use as a communication device, BCIs are also finding new application as a tool to assess the emer-

gence of individuals with TBI from coma. In these cases, patients are provided with a stimulus that has been shown to elicit specific evoked EEG potentials. Stimuli under investigation include auditory and vibro-tactile. Ideally, patients demonstrating responses may be candidates for simple yes/no communication before fully emerging from coma and regaining the ability to communicate using other methods.

This technique is being reviewed by the TBI Program at the Minneapolis VA Medical Center.





## AT Lab Highlights...Palo Alto



### **Collaborative learning and development opportunities continues to be a focus area for the VA Palo Alto Health Care System:**

The joint DVBIC/VA Palo Alto 4<sup>th</sup> Annual TBI Research Forum focusing on TBI and Technology was held in March 2014 to correspond with Brain injury awareness month. VA Palo Alto's Director of Assistive Technology, Jonathan Sills, PhD, sat on the conference planning committee and helped to coordinate various conference exhibitors and presenters. In addition to the conference exhibitions, upwards of 20 research posters were presented by participants affiliated with academic institutions such as the University of California San Francisco, University of California Berkeley, Stanford University, and Santa Clara University. The conference key note talks on New Concepts in Cognitive Training for Impaired Neural Systems, Development of the Concussion Coach Application for Patient Self-management and Tracking of Symptoms, and TBI and Civic Design were also very well received by attendees. Each key note presentation engaged listeners with examples of emerging computer programs and expand participants understanding as to how advances in computing technologies may support better patient outcomes following TBI.

In late February of 2014, the VA Palo Alto AT Center hosted Stanford Engineering faculty and students in a tour of the AT lab. The focus of the tour was to provide a real world look as to how assistive technologies are deployed within medical settings. VA Palo Alto AT staff provided hands on opportunities for faculty and students to trial various pieces of equipment used to support cognitive functioning, communication, and adaptive sporting activities.

The tour's success was further supported by a recent collaboration between AT center staff and engineering students enrolled in Stanford Universities Perspectives in Assistive Technology class. At various times over the past quarter, VA Palo Alto's Occupational Thera-

pist, Karen Parecki, OTR/L provided two mechanical engineering students with consultation which allowed the students to research, design, and develop a prototype of a backup alert system for power chair users. The prototype uses proximity sensors to trigger various red, yellow, or green colored LED lights which illuminate to indicate how close the back of the chair may be in relation to an obstacle such as a wall or a curb. Although still in the development phase, the prototype should allow for greater safety for power wheelchair users.

### **ATIA 2014 Orlando: Speaker Evaluations show positive outcomes for VAPAHCS AT staff.**

Earlier in 2014 Evi Klein, CCC-SLP, and Karen Parecki, OTR/L, gave a talk on *Interdisciplinary Service Delivery for Patients with ALS*. Conference attendee feedback indicated that the talk was well received and of high value; results from conference feedback surveys indicate that the overall quality and content of the presentation was Excellent and that the information presented was perceived to be of high value to future clinical practice. Among attendees that completed feedback surveys, nearly all reported that they would recommend Ms. Klein and Ms. Parecki as a speaker at future ATIA sessions.

### **Optimization of the delivery of patient services:**

Informed by the work of the VAPAHCS AT clinic staff, the VA Palo Alto's Director of Assistive Technology, Jonathan Sills, PhD, partnered with VA Palo Alto Neurology Physician, Richard Reimer, MD, and Acting SCI Service Chief, Doug Ota, MD, to develop a new interdisciplinary and interdepartmental clinic to better support outpatient ALS specialty care within the VA Palo Alto Health Care System. The new ALS specialty outpatient clinic is set to be operational in April of 2014 and will be built upon a model where local ALS patients will be seen by an expanded provider team comprised of a Neurology Physician, Assistive Technology Trained SLP and OT Therapy staff, Nursing Staff, and Social Work or Veteran's Benefit staff at a single location.

# Creating New Solutions through 3D Printing, cont.

(cont. from Page 1)

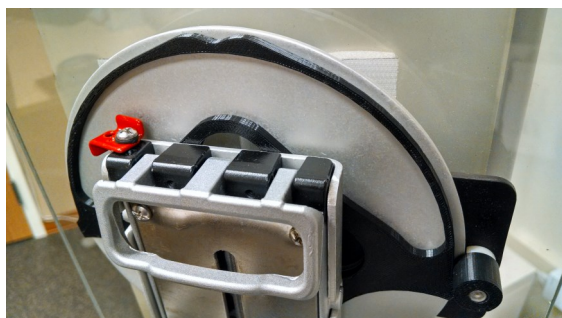


Figure 4—Version 2

After discovering that a universal cell phone mount from one company was not compatible with the wheelchair mounting hardware from another company, rehab engineer Brian Burkhardt redesigned part of the cell phone mount to be compatible with the wheelchair mounting system (Fig 5). This solution has been used with multiple



Figure 5—Cellphone mount modification

Veterans and even allowed a quick mouth stick holder to be created for a veteran based on Brian's design (Fig 6).

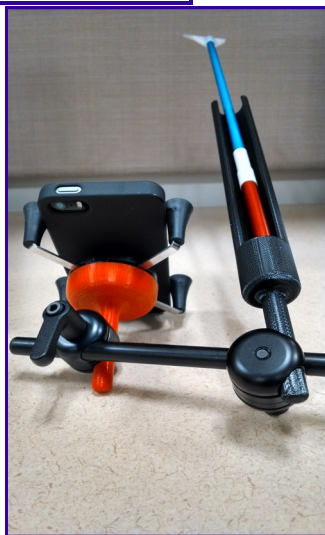


Figure 6—Mouth stick mount modification

These are just a few examples of how the rehabilitation engineers are taking everyday challenges the Veterans experience and creating real time solution. The two main reason 3D printing is used is when there is an urgent need such as when a Veteran cannot wait for a purchased item or when a needed item is not commercially available. 3D printing has become a valuable clinical tool in Richmond for creating quality custom solutions for the veterans.

Additive manufacturing, commonly referred to as 3 dimensional (3D) printing is an advanced manufacturing process which allows a 3D physical object to be created directly from a 3D virtual computer model. Developed in the 1980s, this technology has become much cheaper and more robust in the last decade allowing this high tech process to



AT Logo on building platform

be used in everything from the fashion industry to the medical field. There are several different methods for performing 3D printing based on the precision requirements of the part being created but all create parts in the same general way. A very thin layer of material is deposited one on top of the other like a layer cake for example, until after many layers the object is created. The material being used for printing is most commonly a type of plastic but can include metals, ceramic, concrete, sugar and chocolate.

The McGuire Assistive Technology Program is excited to see 3D printing being used in the clinical rehab environment and looks forward to collaborating with veterans and staff to create uniquely suited solutions for our Veterans.

## Veteran's Story...Delano Draine

**"I am much more independent and have less things to worry about."**



Mr. Delano Draine

Environmental Control Units (ECU) can be somewhat intimidating to a new user. Occasionally patients are not excited about adding this technology to assist in their daily activities. Mr. Delano Draine was one of these patients. Although hesitant, he gave the Assistive Technology Program a chance and is now a shining example of the benefits of the right technology, at the right time, and in the right setting.

Mr. Draine, a 55 year old gentleman, served in the Army as a Teletype operator. In 2012 he was injured and has C4 ASIA C incomplete tetraplegia. When admitted to the Spinal Cord service for rehabilitation Mr. Draine was given access to his nurse call and in room television with two separate sip-and-puff switches. These gave him independence, but were cumbersome and did not allow telephone access.

### **Tell us about your experience with the AT Program.**

*I was very apprehensive about using an ECU at first, but it really comes in handy. I have so much more independence and access to the outside world. When I first used the Quartet Simplicity ECU I was in a two person room. I didn't use it much because it talks out loud and I didn't want to annoy my roommate. When I moved to a single room I started using so much I had the sip-and-puff switches removed. Instead of having two straws in my face all the time I just have a microphone close by*

*my pillow.*

### **What challenges were you having that precipitated your referral to the AT Program?**

*I am a Quadriplegic patient and was using a sip-and-puff to access the nurse call and the television. I wanted more control and access. I wanted to make and receive telephone calls by myself, without having to call a nurse to help me. Also, the sip-and-puff straws were so difficult to position so that they were close enough for me to reach, but not in my mouth all the time.*

### **Who did you see and what device did you receive?**

*My Occupational Therapist, Heather Kloeping, introduced me to Brian Burkhardt who setup and trained me on using the Quartet Simplicity ECU. The Quartet uses voice recognition to allow me to control the telephone, nurse call, television, and even a Kindle E-reader.*

### **How has the Quartet changed your life?**

*I am much more independent and have less things to worry about. I can actually answer the telephone now, instead of calling someone to answer it for me. I talk to my friends and family much more now. The sip-and-puff switch for the television changes the channels, but you can only change the channel up. So finding the channel I want to*

*watch was very time consuming. With the Quartet ECU I can access all the television functions anyone else can, just by using my voice.*

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

*I can make and receive telephone calls, I can control the television with ease, and I am reading books on a Kindle.*

### **Would you say your quality of life as improved?**

*It has improved greatly. I feel like I have almost unlimited access to the outside world and the things around me.*

## TECH IT OUT – ATIA ORLANDO 2014 HIGHLIGHTS

### – BY TAMPA AT PROGRAM

#### App-y Hour

*Proloquo4Text* AAC app: text/phrase based app, iOS only, 90 voices and 50 languages, share via social media, word and sentence prediction, no voice recording, \$129

*RocketKeys* AAC app: customizable keyboards, native accessibility features for vision and physical impairments, iOS only, webinar training available, \$159.99

*Voice Dream Reader*: text-to-speech app for multiple text formats, links with Bookshare and Gutenberg, good speech synthesis, half the price of Bookshare's Read2Go app, \$9.99

*Any.do.to-dolist* app: cloud-synced, voice recognition, shared lists, iOS and Android, free

*Pomodoro*: timer app for procrastination and time management incorporating timed breaks for specific tasks; free on Android and iOS

change settings automatically

*Pointing Wizard* Software— adjusts user's pointer settings automatically

*Single Switch Performance Test* – software to facilitate measurement of the ability to activate a single switch. Measures the average time required to activate or release the switch and also can measure the speed of repetitive activations. Free download

*Assignment Calculator* – open source and customizable calculator which provides users with estimated completion time for step-by-step tasks including general deadline dates to keep you on track with assignments, provides resources, can copy and paste tasks into your digital calendar

*Sqworl.com* – web app that provides a clean and simple way to visually bookmark multiple URLs

*Soundgecko.com* – instant MP3 conversion of digital articles allows users (iOS, Android, Windows apps) to multi-task and clear their reading list while doing other things

#### Products

*Tremor spoon*: stabilizing spoon, <https://www.liftlabsdesign.com/>

*Audio Notetaker*: laptop based audio recording software with built-in organizational features

*Jot Pro Pen Stylus*: fine, sound dampening tip for precise writing on iPad, magnetically attaches

*Compass Software*— create charts to compare accuracy/speed of access across devices, provides suggested scanning rate, may be available on iPad in the future, can run on Surface tablet

*Keyboard Wizard Software* – establishes sticky keys and repeat settings and can

#### Professional Development

*Padlet.com* – mobile wall for posting discussions, brainstorming, taking notes or collecting feedback from presentations, add multimedia, instant collaboration and comments

*Today'smeet.com* – backchannel to connect with your audience in real time, live stream commenting

*Nearpod.com* – interactive presentations and lessons in mobile format, live Q/A, quizzes and free text formation, great for group treatments or lectures





## 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

### ASSISTIVE TECHNOLOGY EDUCATIONAL OPPORTUNITIES through EES

**Program Description:** This live – meeting program is designed for Rehabilitation Services physicians and rehabilitation clinicians to address the knowledge gap in providing assistive technology that addresses current health care requirements of Veterans with specific rehabilitative needs. This course will cross many areas of disability including, Polytrauma, Visual impairments, Physical limitations, Cognitive and communication deficits that may limit Activities of Daily Living. There are 5 Assistive Technology (AT) labs located at the Polytrauma Rehabilitation Centers; however, this training would expand that knowledge and skills of providers beyond those 5 AT centers. The training will assist in increasing Veterans' level of function, independence and safety while providing consistency and care across the VHA system.

**Audience:** Health care professionals including physicians, speech-language pathologists, occupational therapists and other clinical staff such as physical therapists, recreation therapists, blind rehabilitation specialists and kinesiotherapists.

**Topics:**

May 2, 2014 (1-2pm EST) – Applications: Communication

June 6, 2014 (1-2pm EST) - Applications: Environmental Controls

July 11, 2014 (1-2pm EST) - Applications for Visually Impaired Veterans

August 1, 2014 (1-2pm EST) - Adaptive Devices for Visually Impaired Veterans

September 5, 2014 (1-2pm EST) - Environmental Controls: Standard Evaluation/  
Prescription

October 3, 2014 (1-2pm EST) - Environmental Controls: Education & Training

November 7, 2014 (1-2pm EST) - Outcome Measures

December 5, 2014 (1-2pm EST) - Integration of Technology

