A three day VA organized and staffed conference to immerse attendees in Assistive Technology. This was a wonderful experience for those that were given the opportunity to participate. Therapists, Engineers, and even Prosthetics Professionals were able to meet, interact, and promote cooperative solutions for current and future policy improvement. Instructors were mainly VA employees from various locations and disciplines. Educators on Cognitive Tools and Augmentative Aids to Communication demonstrated a variety of apps to help with organization and time management. They had also recruited several clients that were using the skills and tools developed through their programs to speak about their experience.

Vendors for several AAC manufacturers demonstrated apps, AAC’s, and lower tech communication devices. Notable products were the Noteability app and Low Tech solutions Laser pointer and word boards. Noteability is a great tool for students, and anyone needing help with notetaking. It is an app that will record a lecture/conversation, and synchronizes notes to speech time points; it will convert written text to type; you can include sketches and images as well. Low Tech’s laser pointer is a simple laser pointer meant to clip onto a glasses frame. In conjunction with their efficient sight boards the accuracy and speed of communication is greatly improved.

Hands-on activities involved trialing of KT adaptive driving solutions; various environmental controls solutions (presented by McGuire’s own - Brian Burkhardt); hand cycle, basketball wheelchairs, sit-ski, and fitness adapted computer games from Adaptive Sports and Recreation; hearing aids and how they work/sound; a set of glasses that will read text and recognize faces, labeler pen and stickers to audibly identify objects, and optical character recognition devices (OCR) for sight limited individuals from VISOR and BROS; manual and power wheelchairs, seating systems, and pressure mapping from University of Pittsburgh and Ohio State’s Seating and Mobility Specialists. It is amazing how much of a difference a properly setup and prescribed wheelchair makes on sitting comfort, endurance, and overall utility.

The long and short is that we in the VHA have a lot of resources that we can bring into play to help the Veterans that we serve. If you aren’t aware of a solution, ask a therapist in the discipline that your problem pertains to. If you don’t know who that is, ask one of your Assistive Technology team members, and they can at least point you in the right direction.
Meet McGuire’s AT Team

Jessica Barton joined the Assistive Technology Team this past summer as one of the speech language pathologist (SLP).

In her own words, here is some information about her.

Tell us about your professional background

I have been a Speech Language Pathologist since 2008. I started my career working within the school system in Los Angeles CA were I worked with moderately-severely impaired children from preschool to 8th grade. In 2013, I moved back to Richmond VA and began working with a private company, Talk LLC, primarily doing home health with adult patients. And in 2015, I started working at the Richmond VA as the PNS outpatient speech therapist and PNS telehealth coordinator.

How long have you been at the VA?

I have been working here for about 2 years. Started as a part-time employee and have been full-time since September 2016. I currently am working as the PNS outpatient SLP, PNS telehealth coordinator, and STAR inpatient SLP.

What do you like about working at the VA?

The Veterans. I moved back to Richmond in 2013 when my father was diagnosed with pancreatic cancer, he passed away within 1 month of his diagnosis. My father is a Vietnam Veteran and received his care here at the Richmond VA. I was very impressed with the care he received and thankful for the support the staff offered myself and my family. I am very proud of my position here at the VA and am grateful to have the opportunity to give back to our Veterans.

Why are you passionate about AT?

I am passionate about helping Veterans improve their cognition and communication skills. Seeing a variety of low tech and high tech AT devices assist Veterans with cognition as well as communication is very exciting. I look forward to learning more from the AT department.

Tell us about other interests outside of the VA.

Outside of the VA I mostly enjoy spending time with my husband and 1 year old son. We love anything outdoors; camping, hiking, hanging at the beach, riding bikes, and taking road trips…especially impromptu road trips! I am also a wood artist and I occasionally have art shows in the community. I inherited my father’s old tools and surprisingly found that I love working with table saws, chops saws, and sanders!

PM&R ASSISTIVE TECHNOLOGY
Mr. Phil Swinford served in the United States Army as a colonel infantryman. Mr. Swinford suffered from a traumatic spinal cord injury while mountain biking that left him in very critical condition. While Mr. Swinford had a long road of recovery ahead of him, he found the willingness of the Assistive Technology team to think outside of the box in order to meet his goals to be refreshing and exactly what VA needs to fulfill patient needs. Swinford related Patients at the VA Medical Center to the people that Henry Ford was talking about when he said, “If I had asked people what they wanted, they would have said a faster horse.” Similarly, often Patients do not know exactly what they need to meet their rehabilitation goals and Mr. Swinford found that the Assistive Technology Program was able to find solutions for his needs “as a faster horse and to make things better for him as a Patient.”

When Mr. Swinford was first brought to McGuire hospital, he faced the problem of the nurse call button moving away from him. He had no way of talking and alerting the nurses when he would need anything. Brian Burkhardt, clinical rehabilitation engineer in the Assistive Technology Program, was able to attach a sip and puff switch, connected to the nurse call button, to his cervical collar. If he moved, the nurse call button would move with him. Mr. Swinford received many devices enabling his independence in communication and mobility with the help of Brian and rehabilitation team. Mr Swinford was a very engaged Patient and problem solver using his engineering background to help create new solutions. A custom switch multiplexer, 3D Printed custom joy stick, and complete cell phone access are just some of the solutions that Mr. Swinford uses daily.

When asked about the experience with the assistive technology program, Mr. Swinford had only positive things to say.

How has the device changed your life or impacted your life?

“All of the devices have positively impacted my life and allowed for much greater independence and provide back-up for each other.”

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

“Since the sip and puff has not been working, I have learned to control the chair better using the joy stick. I am able to stand independently on a daily basis.”

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

“Assistive technology should be something that all VA’s implement. Also, Brian’s initiative with students at VCU is good for the students but also value added for the VA.”

“If I had asked people what they wanted, they would have said faster horse” – Henry Ford
Thanks to diminishing costs and increased public accessibility, 3D printing, or the practice of building objects out of many thin layers of material, has accelerated and grown its hold over those interested in prototyping and designing custom parts. It’s not just a fancy toy; the AT program at the McGuire Veterans Medical Center has relied heavily on its 3D printing capabilities to make one-of-a-kind design solutions for problems that haven’t yet been solved commercially.

Our workhorse 3D printer is a Dimension 1200es, which extrudes melted ABS plastic onto a bed and zigzags around to build up parts that we create using CAD, or computer-aided design. It is a FDM printer (Fused Deposition Modeling). These parts turn out fairly tough and rigid, with AT uses such as:

- an outer casing to house and mount custom indicator lights for a patient’s power wheelchair
- creating a button pusher to control a patient’s hospital bed
- a cane clip for a patient’s scooter
- a keyboard overlap to help patients with typing on touchscreens

These parts typically take a few hours to print and clean up, so that a design printed early in the day could be delivered to a patient before close of business.

Despite the wide-ranging potential of printing in ABS plastic, however, there are some drawbacks: the plastic is inflexible and can be cracked with large force application. That’s why the AT program recently acquired a second, small 3D printer called the Form 2 (see Fig. 1) which builds using stereolithography (SLA). It contains a vat of resin, or a viscous liquid substance, and prints layer by layer via aiming a laser around in the shape of the layer and hardening the resin, which is tuned to react to a certain wavelength of light. Because one can introduce different types of resin, one can create rigid or flexible parts, opaque or clear, or even parts that can serve as a mold for other parts (see Fig. 2).

In addition, using a laser means the layers can be printed much more precisely and accurately. Because of this printer’s unique capabilities, the first SLA print the McGuire AT team attempted was a clear lightbulb, impossible to achieve using an FDM printer. Future projects may include:

- a joystick molded to conform precisely to a person’s hand
- longer-lasting, small gears with finely tuned precision
- molds to improve the production of frequently used mounting hardware for wheelchair patients

Because of the 3D printing resources that the VA has invested in, the AT team members at McGuire have been able to provide incredibly specific, sophisticated care to veterans in need that they could not receive anywhere else!