Nicole Shuman, CRTS, who is with the McGuire Adaptive Sports Team, came to the Assistive Technology Program with an air rifle that a veteran had modified to be fired by sipping on a straw. It was a great improvement over what is available on the market since it only required a 9-volt battery and was very unobtrusive. Other solutions available require a 12-volt car battery, or are so bulky that they don’t lend themselves to be used by participants with strength/motor control deficits.

Unfortunately, the Veteran who built the adaptation had passed away, and the mechanism was now broken. Ms. Shuman asked the Assistive Technology Clinical Rehabilitation Engineers to repair it and if possible design a replacement that would work with various models of air rifle. The design requirements were the same as what Mr. Charles Reed Weir had built, with the added requirement of it needing to work on different brands of air rifle without any modifications to the gun itself. The design that Mr. Weir had come up with required some minor modifications to the air rifle itself where the trigger itself is removed to make room for the actuator.

Our Clinical Rehabilitation Engineering team worked on coming up with a trigger puller using these design criteria. The first attempt was to carry over the Veteran’s solution (using a tiny solenoid actuator) into the new design. However, after initial testing it became clear that the actuator was not strong enough to pull an unmodified air rifle trigger mechanism. They went back to the drawing board and replaced the actuator with a servomotor that would have the strength to pull most air rifle triggers. This required some additional design work to build up the circuitry and programming to control a servomotor. With the additional circuitry, they were able to include a feature that allows the user to pull the trigger halfway to the ‘hair-trigger’ point, then when their target is lined up, the user sips again to complete the firing sequence.

Throughout the design and build, Mr. David Coffield gave us valuable feedback that helped to direct the execution of a solution that would work well for him and other Veterans to participate in air rifle shooting sports. Mr. Coffield helped the Clinical Rehabilitation Engineers to discover several weaknesses in the design, as it was being used, that have helped them to prepare a new improved version that is soon to be released.
Boccia is an adaptive sport that has increased in popularity in recent years. Introduced to the Paralympics in 1984, it is one of only two Paralympic sports that has no Olympic counterpart. Boccia originally started as an adaptive sport for those with Cerebral Palsy, but is Paralympic participation is now open to athletes of varying physical disabilities. Boccia is a sport of coordination, strategy and concentration. Boccia can be played in many ways: one-on-one, two-vs-two or three-vs-three. A regulation boccia court measures 6 meters by 12.5 meters with boxes for the players at one end of the court. These boxes measure 2.5 meters by 1 meter and players must remain in the box for the entire game. The object of boccia is for players to land their game balls as close to possible to a target, specifically, a white game ball called the “jack”. After the jack is thrown and each team throws one of their 6 red or blue game balls, the team who is furthest away continues to throw until all balls are thrown. After all balls have been thrown, the referee then awards points to one team based on how many game balls they have closer than their opponents closest ball. The use of adaptive equipment in boccia is increasing. Those without functional ability to throw the game balls on their own are able to use either a ramp system and a sport assistant to place balls on the court. Boccia is also a great sport for those with visual impairments, participants can use a grid system to determine the positioning of the ball on the court. One of the best adaptations for those who use wheelchairs or have trouble holding the balls is really a simple system- the use of the ADA lap system with the Velcro top insert and then a piece of Velcro on either a muffin tin or a cake pan, as seen in the picture.

Boccia may seem like a simple game, but as players advance in the sport, the strategic play can become very fun and exciting to watch and to play. The most exciting thing about boccia is that it is a very inclusive sport, and when not in competition, those with varying disabilities are able to play together. Veterans participate in boccia through adaptive sports, at the National Veterans Wheelchair Games, and at the National Veterans Golden Age Games.
Veteran Story...Mr. William A. Hines Jr.

Mr. William A. Hines Jr. is a 75 year, decorated Vietnam Veteran (Bronze Star and Legion of Merit). He is a retired US Army Lieutenant Colonel. He has been married for 51 years. Mr. Hines is devoted to youth development, especially in leadership and service. He enjoys spending time with grandchildren, playing cards, fishing, and traveling with friends and family. For the past 2 years he has been battling a Neurogenerative Disease known as Amyotrophic lateral sclerosis. This has left him with the inability to verbally communicate. His family and him had the goal of having better communication.

Tell us about your experience with the Assistive Technology Program (Speech, driving rehab, OT/PT/RT).

From the very first, working with this program has been educational, efficient, and delightful.

What challenges were you having that had you referred to the program?

I was having declining speech that resulted in a decrease in my communication interactions.

Who did you see?

Brittany, Seth, Brian

What device/program did you get?

I received a ZUVO AAC device with eye gaze

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

The AAC device allows me to more interactive with my others and gives me an option to increase my communication.

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

I am now able to interact with others using my AAC device. It is less frustrating to communicate with others.

Would you say your quality of life has improved?

Yes, absolutely!

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

No. The Assistive Technology team has been very helpful. They work together to problem solve and meet our needs and work with my wife to make sure she is trained to support me.

Adaptive Sports Making an Impact through Telehealth

The Adaptive Sports Tele-Rehab Clinic, a collaboration between the Hunter Holmes McGuire VAMC in Richmond, VA and the Louis A Johnson VAMC in Clarksburg, WV, scheduled its first veteran in June, 2018. Mr. K, a 38 year-old male, presenting in his local VA in Clarksburg, had prescriptions from both his medical physician and his psychologist for participation in recreational and leisure activities to manage symptoms related to his service connected condition. However Mr. K’s condition impaired his ability to follow his doctors’ orders without specialized assistive equipment. Unfortunately, there were no providers locally to evaluate and prescribe this equipment. However there were professionals in the Richmond facility who were able to provide this level of care. And because of the tele rehabilitation services, the teams from both facilities were able to work together remotely to deliver these specialized services without taxing the veteran with traveling away from his local medical center.

The Richmond adaptive sports team consists of an assistive technology provider, occupational therapist, recreational therapist, and physical therapist. Their team along with the assistive technology provider/occupational therapist at the Louis A Johnson VAMC was able to exchange valuable assessments and recommendations for Mr. K in a virtual medical examination room. Mr. K demonstrated a strong commitment to his healthcare plan and was issued an adapted cycle in November, 2018. This veteran now has the ability to enjoy participation in a number of recreational activities both at home and out in his community.

For the partnering professionals in these tele rehab collaborations, serving the veterans with expanded access to more services means delivering superior

“The bike is great!”.
Hydration is an issue that people with limited mobility quickly realize is important to address. Some people can readily access their drink of choice with a simple solution, such as a cup holder on their wheelchair or bedside, while others require a more comprehensive answer. We have several products that we rely on to deliver hydration here at the McGuire VA.

Fleximug offers a hands-free drinking mug with a flexible, long straw. The straw (comes in various lengths from 16”-36”) is removable for easy transportation, and the mug is leakproof and vacuum-insulated for temperature maintenance. All components are dishwasher-safe, and the company includes an 18” cleaning brush for the inside of the straw. The company also makes the Flexistand, a small mounting table for a bed, as well as a clamp-on cup holder for manual wheelchairs. Some minor tinkering may be necessary to get the cup holder onto a power wheelchair.

Mealtime Partners, Inc., is a company that makes both assistive eating and drinking products. They make several types of drinking solutions: a cup holder mounted on a flexible arm that brings a standard water bottle or cup closer to a person’s mouth, a hydration backpack (CamelBak) with LocLine tubing to position the straw and bite valve, and a product like Fleximug called the Drink-Partner. Mealtime Partners also addresses the problem of mounting drinking systems by offering tube clamps, slide track hardware, and clamps for mounting onto a hospital bed. Depending on the person’s need, one can select the appropriate mount without needing to tinker and adapt.

Recently ModularHose.com has begun offering their own drinking product, the Giraffe Bottle Hands Free Drinking Solution. It is similar to the Drink-Partner, but only has a bottle holder with a tube clamp for mounting purposes. It comes with a cleaning brush like the Fleximug and has a check valve so that liquid does not flow backwards into the bottle again, making sipping easier with a long straw. The check valve does not work with carbonated drinks or drinks with pulp in them, but it can be removed in these instances.

Last but not least, the Mighty Mug is a drinking product that helps mitigate spills due to its suction to flat surfaces. This feature may appeal to people that have trouble with fine motor skills, tremors, or spasticity, yet still prefer to rely on gross motor movements. The Mighty Mug is also leakproof and vacuum sealed for insulation.

It can be easy to overlook the value of hydrating regularly and independently, but these products can make a huge difference for people that otherwise could not do so.