

# PM&R Assistive Technology Programs

Volume 9 Issue 2

Spring 2020

## AT Response During COVID-19



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AT Newsletter Edited by:  
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Richmond AT Program  
Coordinator

In early March 2020 the Central Virginia VA Health Care System Assistive Technology Program, located at the Hunter Holmes McGuire VA Medical Center in Richmond, Virginia, was contacted by an Emergency Department (ED) Physician who had been experimenting with 3D printing a face shield at home. "He asked our AT Design Team if they could design something better and faster for the hospital" according to Melissa Oliver, Program Coordinator for Assistive Technology. "From that point the Assistive Technology team worked with Incident Command including Infection Disease physicians, Safety Manager and leadership on approving the production of the face shields."

The Assistive Technology (AT) design team then developed 3 prototypes and received feedback from the ED physicians and Incident Command. After some modifications, the laser cut version was selected by leadership for the AT Team to produce and assemble.

To meet clinical and safety standards the AT Team performed hazard tests of the face shield as required by VA and the National Institutes of Health. After successful completion and review of these tests the Central Virginia VA Health Care System Face Shield received confirmation these locally produced shields meet FDA standards under existing regulations or guidance for clinical use.

In early April 2020 the AT Team along with volunteers from Richmond Polytrauma/TBI teams have produced and packaged over 1,000 face shields for Central Virginia VA Health Care System, 500 for Hampton VAMC and they now are charged with producing and packaging 5,000 for VA Supply Distribution Center. By early June, the AT team and volunteers packaged over 11,000

face shields for VACO.



Assistive Technology Team performs hazard tests on the locally produced face shields to insure these shields are safe for clinical use

The Minneapolis VA Health Care System (MVAHCS) iPad Video Monitoring and Assessment (iVMA) Pilot Program is the result of an innovative collaboration between leaders in telehealth, biomed, clinical applications, nursing, and assistive technology aimed at reducing the use of personal protective equipment (PPE) among staff in COVID-19 units through the implementation of technology that enables video monitoring and assessment. The iVMA Pilot Program was established in March 2020 through a joint effort by Angela Nichols, MVAHCS Telehealth Coordinator, Herb Stockley, Biomedical Equipment Support Specialist, Danielle Matthews, Clinical Applications Coordinator, Brandon Porter, Clinical Applications Coordinator, Ben Barrett, PM&R Assistive Technology Program Coordinator, and Beau Bedore, SCI/D Assistive Technology Director and has already been successfully implemented on three different units throughout the medical center.

"The success of this Pilot Program is due in large part to the unique configuration of iOS settings and the use of accessibility features that were enabled on the iPads to ensure that the interface between providers and patients seamless and efficient," said Mr. Bedore. "The iPads were configured to allow an authorized Provider iPad to instantaneously connect to a Patient iPad in a given room by simply tapping on a shortcut on the Home Screen of the device; this action initiated a FaceTime call that was automatically answered within seconds on the Patient iPad without requiring any action on the patient end (the patient did not need to move nor touch the screen at all)."

Beyond its clinical benefits and preserving PPE the iVMA Pilot Program also allows for family, friends, and caregivers to connect with patients in isolation. This added tool for connection can boost the morale of the patients and their loved ones. To ensure patient privacy and clinical focus, great care, planning, and testing went into this Pilot Program to establish a connection that was stable and secure. The auto-answer feature only worked when the Patient iPad received a call from a designated Provider iPad; the team tested this feature extensively to make sure that this system functioned as a "closed network."

## AT PRODUCT REVIEW: **Nous Assistive Software with Brain Link Headset**

By: Stacy Gross, M.S., CCC- SLP, Aubree Surrency, M. Ed., CF-SLP



### Overview

Novus is a switch option that allows the user with extremely limited mobility to use eye blinking as a switch for various devices. It is made up of both hardware and software. The hardware component is a soft headset that houses the sensors which measure your blinks. Everyone's blinks are different and vary throughout the day. The Nous software can understand your "blink signal" before you start using it as a switch access method. This provides the ability for veterans to access communication devices who may have been unable to otherwise communicate basic needs/wants and medical requests, via use of switch scanning. Included in this product is the Nous software, which is compatible with various Windows OS based computer applications, and the electrode headset (headband, ear clip). Although the primary use of this device is to provide a unique access for communication devices, the Brain Link headset may also be used with an application to improve cognitive functions (e.g. attention). In order to utilize, the Veteran must don the headset, calibrate/link the device and begin blinking to communicate their wants/needs.

### Indications

The following criteria must be met for Veterans to be issued and trained in the use of Nous:

- Veteran must participate in a complete AT/OT/SLP evaluation to determine the patient's cognitive and communicative abilities.
- Evaluation must indicate a condition that is resulting in permanent, transient or intermittent severe expressive and physical impairment.

- Evaluation also must demonstrate the Veteran's physical and cognitive abilities to support the use of Nous vs. another switch/access method.
- The patient is unable to meet communication of basic wants/needs functionally with the use of natural communication methods.
- The patient is unable to functionally access device during device trials.
- Veteran demonstrates improved communicative function and ability to access device during device trials.
- Veteran demonstrates motivation and willingness to use Nous as prescribed.

### Contraindications

In general, Nous should not be issued when:

- Veteran does not demonstrate an expressive impairment for which AAC is indicated.
- Veteran does not demonstrate measurable improvements in basic communication and environmental access with use of Nous.
- Veteran's cognitive abilities present as a barrier to use of the device.
- Veteran presents with visual deficits (e.g. low vision) that present as a barrier to use of the device.
- Veteran's functional needs can be met effectively with verbal/natural speech, low tech AAC or other access methods.

### Criteria for Evaluation of Assistive Technology Device

**Affordability:** The price of the device is \$1,995.00, which includes the Nous software and Brain Link headset. This is expensive for just switch access. The bio sensors that are initially included with the headset require replacement every couple of years. Unclear as to cost of replacement of bio sensors. Six-month warranty in addition to a 30-day free trial is available.

**Compatibility:** This product can interact with any Windows OS based computer application that responds to keyboard

press or mouse button clicks. Other switch access methods also possible and may be assigned within AAC software. This reduces the risk of the device becoming obsolete in the future as it operates with various systems. Examples of Windows OS applications that Nous is accessible with are: Communicator 5 and Snap & Core by Tobii Dynavox, NuVoice by PRC, Grid 3 by Smartbox and Clicker 7 by Crick Software. Of significant note, this software may only be used with a scanning format which can be tedious for user. The Nous team is continuing to develop improvements and may be contacted at [nous@thought-wired.com](mailto:nous@thought-wired.com) to provide suggestions for integration with other software applications.

**Consumer Repairability:** Only expected repairs will be replacing the bio sensors every couple of years and headband due to wear and tear. This likely will only require simple instructions to complete repair and no specific education/training.

**Dependability:** The dependability of this product hinges upon the effectiveness of the initial calibration. Set-up of calibration is easy. Dependability information was gathered by hands on clinician and rehab engineering use. There are risks for false positive and false negative results based on too low or too high blink threshold settings. If threshold is too low, this could cause your natural blinks to be confused with intentional blinks (false positives). If threshold is too high, your intentional blinks that you wish to use to select options on the computer are not detected (false negatives). The battery on this product lasts approximately 4-6 hours, therefore, it is important to consider the Veteran's communication needs. It takes approximately 90 minutes to receive full battery charge. In addition, the headset may not be able to achieve accurate signals if there is facial hair or dirt/oil present in the headband location. Nous requires 200 MB of storage in order to run effectively/efficiently. If room temperature is too high, sweating of patient could potentially cause disruption of bio sensors. (cont., page 3)

## AT PRODUCT REVIEW: Nous Assistive Software with Brain Link Headset , cont.



**Durability:** This product appears very durable and is not expected to require significant/frequent repairs. If the Veteran develops issues with the headset, it is recommended that Nous is contacted prior to requiring replacement for troubleshooting. Minimal effort would be required for maintenance as it should only require replacement of the bio sensors every couple of years.

**Ease of Assembly:** In order to set up the device, the Veteran will need to locate the Nous information page which comes with a trial version. Nous must be registered through patient's email address. Once downloaded, Nous should automatically pop up on the computer screen with instructions to follow for set-up of the device. Use of the headset piece is easy, however, the directions provided in the package are not consumer friendly. Recommend watching YouTube video or following the Nous instructions to explain set up of the device. Once set-up, the calibration portion is fairly easy, requiring only 8 eye blinks.

**Ease of Maintenance:** The only maintenance required would be replacing the bio sensors every couple of years. Programming of the grid communication boards/quick responses may be warranted for customization; however, Nous simply provides access to the devices not the device itself. It is recommended to wipe down the bio sensors with a wet wipe after every use for cleaning purposes.

**Effectiveness:** This product claims to provide a unique and easy way to communicate for those with severe physical limitations. Given that the Veteran is cognitively and visually able, it allows for improved communication of basic wants/needs, medical requests and environmental access for individuals in long term care facilities, TBI Veterans, spinal cord injury Veterans, and other Veterans with neuro-degenerative diseases. It can provide a solution for access to communication devices or other windows OS devices.

**Flexibility:** In terms of the headset, it only comes in one size. For those who feel the headset is too large, it is recommended that a clip be used to adjust the size to one's head or that one sews it to a smaller size headband. If the headset is too small, the company suggests increasing use of headband to stretch throughout the day.

**Learnability:** If cognitive and visual abilities support use of the Nous, the Veteran may begin using the device following initial session of training. Training may be warranted for set-up of device, calibration of blinks and use of switch access for a communication device.

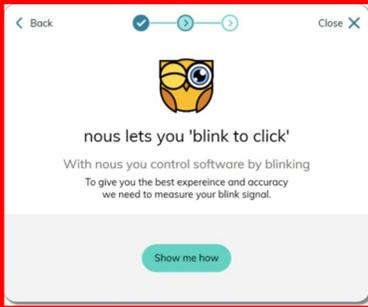
**Operability:** Most patients will require assistance from caregiver for placement of headset and power on/off as the Nous is primarily used for patients with significant physical limitations. The patient must be within 15 meters of AAC device for bio sensors to be recognized by software. Chances for poor responsiveness are impacted by the calibration of the sensors as it relates to the dependability of the product. The headset is only used with switch scanning and cannot be used as direct selection.

**Personal Acceptability:** The product itself is a software and avenue for access with AAC devices. The headset is lightweight and appears as a headband in order to increase the normalcy of the switch. Sensors must be flush against forehead and hair must not interfere with the bio sensors. The brain link does have relatively loud beeping with good connection as well as low battery. This product is easily removeable and can be stored when not being utilized by the Veteran.

**Physical Comfort:** The device is lightweight and generally comfortable for brief use. However, this can cause some discomfort with extended use. The headset is elastic, however, only comes in one size which may cause irritation based on the size of the user's head. If headband is small, the Veteran may experience some discomfort or itchiness until the headband is stretched out from frequent use as recommended by the Nous development team.

**Portability:** This product (in terms of the headset) takes up minimal space and may be transported in a pocket or small bag. It is likely that the Veteran will be utilizing this switch access method in conjunction with an AAC device that may not be as portable depending on the weight and size. The portability of the headset portion allows for the switch to be utilized in different environments with limited set up required, if it is charged. The battery on the headset (cont. page 4)

**AT PRODUCT REVIEW: Nous Assistive Software, cont.**



lasts approximately 4-6 hours and requires up to 90 minutes to charge completely. The charger is small and attaches to wall outlet via USB connector.

**Securability:** As this device is typically used with those with severe physical limitations, it can place the Veteran at higher risk for theft. The device is small and can also be easily discarded or misplaced if not handled appropriately by caregiver. There are no special features that could improve

security, other than consistent caregiver assistance. The headset also comes with a clip in piece that if not secure has the potential to disconnect easily from headband. In order to improve the security of the device, the user should ensure that both clips of the device are secure.

**Supplier Repairability:** There is no need for local suppliers or repair shops to repair this device. If the headset becomes faulty it is recommend-

ed that the Nous software team be contacted directly to explore the possibility of repair or replacement. For technical support, the veteran can contact the team at Thought-Wired at nous@thought-wired.com. The veteran can also get ask questions with members of the team via live chat option through website <https://getnous.app/>.

| 1                    | 2                             | 3                      | 4               | 5              |
|----------------------|-------------------------------|------------------------|-----------------|----------------|
| Not satisfied at all | Not very satisfied            | More or less satisfied | Quite Satisfied | Very Satisfied |
|                      |                               |                        |                 |                |
|                      |                               |                        | <b>Score</b>    |                |
|                      | <b>Category</b>               |                        |                 |                |
|                      | <b>Affordability</b>          |                        | 2               |                |
|                      | <b>Compatibil-ity</b>         |                        | 4               |                |
|                      | <b>Consumer Repairability</b> |                        | 4               |                |
|                      | <b>Dependabil-ity</b>         |                        | 3               |                |
|                      | <b>Durability</b>             |                        | 4               |                |
|                      | <b>Ease of Assembly</b>       |                        | 5               |                |
|                      | <b>Ease of Maintenance</b>    |                        | 5               |                |
|                      | <b>Effectiveness</b>          |                        | 3               |                |
|                      | <b>Flexibility</b>            |                        | 2               |                |
|                      | <b>Learnability</b>           |                        | 5               |                |
|                      | <b>Operability</b>            |                        | 4               |                |
|                      | <b>Personal acceptability</b> |                        | 4               |                |
|                      | <b>Physical Comfort</b>       |                        | 3               |                |
|                      | <b>Physical Security</b>      |                        | 4               |                |
|                      | <b>Portability</b>            |                        | 5               |                |
|                      | <b>Securability</b>           |                        | 4               |                |
|                      | <b>Supplier Repairability</b> |                        | 5               |                |
|                      |                               |                        |                 |                |
|                      | <b>Average</b>                |                        | 3.88            |                |

## Assistive Technology is a Godsend: How Cooper Tenney Lives More Independently

by Beau Bedore, SCI/D AT Director, Chris Schieffer, DPT, Mike Seabeck, OTR/L, ATP, Ryan Bouslog, DPT, & Janelle Gustafson, CTRS

### Then & Now

It was the Summer of 2012 and a severe heat wave was sweeping across the nation. Cooper Tenney had just returned home to Minnesota after his first deployment in the Army National Guard and was ready to enjoy the hot summer days kicking back and keeping cool in the Land of 10,000 Lakes. On the brink of his 20<sup>th</sup> birthday, Cooper and some friends drove to a cabin (as is customary in Minnesota) to celebrate Fourth on July on the lake. It was an Independence Day he would never forget. As Cooper recollected, "I was unfamiliar with the lake and dove off the dock and the water ended up being too shallow." When he resurfaced, he found himself on a ventilator in the intensive care unit of the Mayo Clinic; he was unable to move his arms and legs. Three weeks later, on July 25, 2012, at the age of 19, Cooper was transferred to the Minneapolis VA Spinal Cord Injury & Disorder (SCI/D) Center with C3 AIS A tetraplegia to begin his acute re-



habilitation.

It has now been seven years since Cooper's spinal cord injury. He lives with his mom in a fully accessible farmhouse that was remodeled after his injury. He is currently enrolled and attending online courses at Minnesota West Community & Technical College (MWCTC) to complete an associate's degree in accounting. When he's not studying, Cooper is an avid gamer and frequently entertains friends. Recently, during his SCI/D Annual Evaluation, he identified a number of new assistive technology (AT)

goals that required the expertise of the SCI/D Assistive Technology Program (SATP).

### AT Needs Change

When the SCI/D AT Team met with Cooper in September of 2018, he identified new goals related to Adaptive Sports and Recreation, Computer and Mobile Device Access, Environmental Control, and Wheeled Mobility and Seating.

Cooper wanted to be able to better participate in adaptive gaming with friends as this was a primary means of social interaction both in-person and online. And while he was adept at using the QuadStick ([www.quadstick.com](http://www.quadstick.com)), he needed to be able to access his adaptive gaming controller in his bedroom and entertainment room (located in the lower level of his home) and this would require specialized mounting equipment for use of the device in bed or his power wheelchair. He also required a new technology interface to be able to operate his multiple mobile devices and computer, including his iPhone, iPad, and Microsoft Surface.

Cooper spent more than 45% of his time alone at home, but had no independent means by which he could access his Bruno Vertical Platform Lift ([www.bruno.com](http://www.bruno.com)) to go from the main level of his home (on the second floor) to the ground level (on the first floor) or even open the door on either level. The team recognized that he needed an autonomous solution that would allow him to evacuate his home in the event of an emergency or fire.

Cooper and the team also identified the need for a new power wheelchair as his current chair was over six

years old and had multiple issues that required frequent repair and maintenance. Furthermore, he reported standing an average of once a week over the past six months, but was frustrated by the difficulty his caregivers had getting him in and out of his standing frame. He was highly motivated to stand on a daily basis, but required the assistance of two caregivers to get him in and out of his standing frame due to his level of injury. Unfortunately, it was not feasible for caregivers to accommodate his request to stand on a daily basis due to staffing constraints. He also emphasized the importance of standing in the contexts of school and work and wanted to be able to speak and deliver presentations at a podium. For these reasons, the team considered a standing power wheelchair to meet his needs.

### Assistive Technology Implementation

After a comprehensive assessment of Cooper's AT needs and a series of collaborative co-treatment sessions with PT, OT, SLP, and RT for development and implementation of identified AT interventions, the team prescribed a wide range of AT solutions to meet his needs:

- Permobil F5 Corpus VS (Standing PWC)
- Head Array Drive System (primary method)
- Sip-n-Puff Drive System (secondary method for bumpy and un-even terrain) (cont. page 12).



Permobil F5 Corpus VS (Standing PWC)



- Head Array Drive System (primary method)  
- Sip-n-Puff Drive System (secondary method for bumpy and un-even terrain)

## AT PRODUCT REVIEW: ClaroCom Pro iOS by Claro Software Limited

By: Katherine Humenik, BA, SLP Graduate Clinician  
Telina Caudill, MS, CCC-SLP, ATP



**Link to Website:** <https://www.clarosoftware.com/portfolio/clarocom/>

**Overview:** ClaroCom Pro is an iOS application that allows its users to replace speech or assist writing for those with impairments in the production or comprehension of spoken or written language. The app allows users to type and store words, phrases, and sentences that can be spoken aloud with synthetic speech. Additional features include flexible phrases, a chime alert, yes/no quickfires, a clean user interface and a unique messaging system among users.

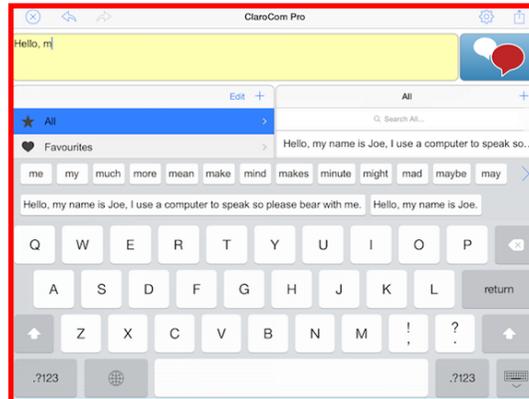
**Indications:** Those who have difficulty with spoken communication including ALS, TBI, head and neck cancer, vent dependence and any other individual with significant speech impairment. Individuals should be familiar with iOS devices and have functional upper extremity use for touch access; however, native accessibility features and/or additional access solutions may be appropriate for those with UE dysfunction.

**Contraindications:** Impaired vision/hearing, severe cognitive/language/literacy deficits, significant upper extremity weakness or incoordination and inexperience with iOS and/or high tech in general.

### Criteria for Evaluation of Assistive Technology Device

#### Affordability:

16.99 for iOS 9.0 or later on iPhone, iPad, and iPod Touch. Free, limited version available.



**Compatibility:** ClaroCom Pro is compatible with iOS only. The free version is compatible with iOS and Android. ClaroCom apps do not support Acapela and ModelTalker voices.

**Consumer Repairability:** App issues may be resolved by shutting down the app, restarting the device, updating the app, referring to the website FAQ, and/or contacting the support team.

**Dependability:** The app has been reliable and dependable.

**Durability:** Not applicable for the app; however, protective cases, hardshells and screen protectors are recommended for durability of iOS devices.

**Ease of Assembly:** Once downloaded, the app requires minimal setup including sound and visual preferences.

**Ease of Maintenance:** Normal maintenance (app updates, hardware updates, battery maintenance).

**Effectiveness:** The app is effective in doing what it claims, which is using text to replace or assist impaired verbal communication. It can increase a user's independence by allowing them to 'speak' instead of having someone else speak for them or using other modes of communication. Yes/no quickfires and an alert chime are useful.

**Flexibility:** ClaroCom Pro offers one free male and female voice; additional

voices available for purchase. The speaking rate can be adjusted; however, there are no pitch adjustments or pronunciation settings. Modified visual settings include font size, message window size, background color as well as phrase and word prediction views. The 'learn as you type' feature is beneficial. Phrases can be added and deleted in bulk for efficiency. 13 languages are available. Native iOS accessibility features may assist those with physical impairments.

**Learnability:** Simple, clean, easy design and interface.

**Operability:** Easy to use and positive user feedback thus far. Clean display limits cognitive overload.

**Personal Acceptability:** Generally, users are more comfortable using mobile devices for social acceptance vs dedicated speech systems. Those that may have personal or cultural preferences to avoid speech generating devices or technology in general would not be a good match for this app.

**Physical Comfort:** None.

**Portability:** iOS and Android mobile devices are portable and lightweight in nature for those with intact UE function. For those with physical impairments, carrying accessories or mounting solutions are indicated.

**Securability:** Access to the iOS device can be secured with a password, facial recognition or thumbprint ID. The "find my iPhone" feature may assist if the device is misplaced.

**Supplier Repairability:** Email and phone contact are options for technical support. The website also provides FAQ's, video overviews and support articles.

(cont. page 7)

## AT PRODUCT REVIEW: ClaroCom Pro iOS by Claro Software Limited, cont.

| 1                    | 2                      | 3                      | 4               | 5              |
|----------------------|------------------------|------------------------|-----------------|----------------|
| Not satisfied at all | Not very satisfied     | More or less satisfied | Quite Satisfied | Very Satisfied |
|                      |                        |                        |                 |                |
|                      | <b>Category</b>        |                        | <b>Score</b>    |                |
|                      | Affordability          |                        | 4               |                |
|                      | Compatibility          |                        | 4               |                |
|                      | Consumer Repairability |                        | 5               |                |
|                      | Dependability          |                        | 5               |                |
|                      | Durability             |                        | 5               |                |
|                      | Ease of Assembly       |                        | 5               |                |
|                      | Ease of Maintenance    |                        | 5               |                |
|                      | Effectiveness          |                        | 5               |                |
|                      | Flexibility            |                        | 3               |                |
|                      | Learnability           |                        | 4               |                |
|                      | Operability            |                        | 4               |                |
|                      | Personal acceptability |                        | 4               |                |
|                      | Physical Comfort       |                        | 5               |                |
|                      | Physical Security      |                        | 5               |                |
|                      | Portability            |                        | 5               |                |
|                      | Securability           |                        | 4               |                |
|                      | Supplier Repairability |                        | 4               |                |
|                      |                        |                        |                 |                |
|                      | <b>Average</b>         |                        | 4.5             |                |



### VETERAN'S SUCCESS STORY ...Eustice Lee

Eustice Lee spent 8 ½ years as an Army Specialist before he retired from that duty. In 2015, Mr. Lee was in an accident that resulted in a traumatic brain injury and left him as a quadriplegic. He enjoys anything IT and spending time with his wife and children. He and his family had the goal of improving his ability to communicate and his independence.

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

*I have had a wonderful experience with the Assistive Technology Program. The therapists were very knowledgeable and always answered any questions I had.*

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

I was having difficulties with people understanding my words since my traumatic brain injury and my wife always had to be there to translate. I couldn't remember when my appointments were and always had to rely on my wife for information. I also wasn't very independent, my wife had to change tv channels for me or turn on lights.

**What device/program did you get?**

*I received an iPad & Control4 System*

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

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

*I can now communicate without my wife translating when my words are slurred. I have reminders on a calendar set up to remind me of all my appointments and what the rest of the family is doing. I can turn a lamp on/off when I want. I can control my tv, satellite, and my Blu-ray player. I have been able to call and text family and friends by myself and anytime I want and not have to wait on someone to do it for me.*

**Would you say your quality of life has improved?**

*I would say that my quality of life has improved greatly*

## AT PRODUCT REVIEW: Lite Run Gait Trainer by Lite Run, Inc.

By: Charlotte Brenteson, DPT; Ryan Bouslog, DPT; Elizabeth Koch, DPT; Crystal Stien, DPT; Alisha Beckett, DPT



### Overview

The Lite Run™ Gait Trainer is an innovative assistive and rehabilitation device for the treatment of persons with gait and balance difficulties from injuries such as spinal cord injury, traumatic brain injury, polytrauma and/or stroke. It uses a specialized soft exosuit (“spacesuit” pants) that unweights veterans by up to one-half of their body weight. The pants attach to an over-ground, unconditionally stable, walker that maintains the pants pressure to the desired level of unweighting. This provides safety and stability for veterans and reduces the therapist’s need to physically support them, freeing his/her hands for therapy and allowing a more dynamic therapy session. The system supports sit-to-stand transitions from wheelchairs and other surfaces so that a single therapist can safely transition a patient to standing for gait training. The Gait Trainer has a compact frame that provides easy maneuverability, and open design that allows the therapist access to the veteran’s legs. The Gait Trainer has an easy to use touch screen interface that accepts variable unweighting, and displays distance walked, walking speed and other metrics. Compared to standard harness lifts, the suit more evenly distributes the patient’s body weight, improving comfort and greater unweighting which ultimately increases the amount of time spent upright during a therapy session. These features reduce physical burden for the therapist and allow for a more diverse population of veterans that can utilize it. Many veterans have lower extremity contractures and/or weigh too much to safely attempt ambulation with even three therapists. Often this patient population is very distractible. There are many built in features that can be utilized to improve focus on desired therapeutic intervention (i.e. screen black out, fixing casters in one direction, adjusting unweighting, etc.)

### Indications

The device is intended for use in a clinical environment on any patient who may benefit from over-ground, body weight supported gait therapy. Patients for whom a harness is uncomfortable may find the exosuit much more comfortable.

### Contraindication

Patients that are > 350 pounds, have active lower extremity blood clots, and/or have open wounds. Pregnancy is a precaution.

### Criteria for Evaluation of Assistive Technology Device

#### Affordability:

The System costs \$79,500, which is well less than robotic exoskeletons and overhead track ceiling unweighting systems. There are no additional training and certification costs, as a one-hour onsite training is sufficient. This differs from the significant training required to certify for exoskeletons. Furthermore, unlike over-ground harness systems, no facility modifications are required by the system.

#### Compatibility:

The Lite Run Gait Trainer has been used with knee-ankle-foot orthotics, functional electrical stimulation devices and prosthetic lower limbs, without difficulty. The patients’ orthotics and prosthetics in these cases fit underneath the soft exosuit. It has been shown to be very helpful for patients that are adjusting to a new prosthesis.

#### Consumer Repairability:

The Company maintains or repairs the device if needed. User repairs are not recommended.

#### Dependability:

The device and exosuits have been reliable for us.

#### Durability:

The device appears to be very well made. The base of the device is very sturdy and can withstand bumping into walls and other surfaces without compromising its safety with use. The Company offers a 7-year extended warranty.

### Ease of Assembly:

The device rolls out of the shipping crate and is ready to use. The amount of time it takes to set a patient up in device depends on many variables (cognition, medical comorbidities, etc). We found an average of 5 minutes in our clinics.

### Ease of Maintenance:

No specific daily maintenance is required beyond routine cleaning of patient contact points such as the arm rests, a wipe down of the exosuits, and recharging the batteries. The Company offers annual routine maintenance which consists of a battery change-out. This may also be done by an in-house biomed technician.

### Effectiveness:

In a clinical study (1) at our VA facility with a crossover comparator, patients were able to walk twice as far and stay upright twice as long in the Lite Run gait device as in a harness system. This may allow increased rehabilitation volume and yield better outcomes.

- Koehler-McNicholas SR, Cataldo A, Koch E, Rud B, Gude L, Brenteson C, Johnson D, Wigness B, Hauck J, Oddsson L, Hansen AH, Evaluation of A Novel Gait Training Device Using A Pressure Suit to Support Body Weight. Proceedings of the 2018 Design of Medical Devices Conference DMD2018, April 9-12, 2018, Minneapolis, MN, USA.

### Flexibility:

The device includes 9 different adult exosuit sizes. In addition, pediatric sizes are available. Included in the system are durable arm rest platforms with 5 degrees-of-freedom adjustability, to accommodate different patient heights, sizes and preferences

### Learnability:

Once the one-hour training is complete, therapists may use immediately with patients as desired. Any clinician that underwent the initial training can train other clinicians. Patients’ (cont. page 9)



## Serving veterans through leadership and collaboration; my journey to ADED leadership

By: Bryan Garrison, RKT, ATP, CDRS

In 2007, I was given the opportunity to work in a specialized field that has become my passion and drive for serving America's veterans and civilian servicemen and women. My supervisor, and service chief, at the Memphis, TN VAMC was providing driver rehabilitation services and was looking for someone to learn the profession and take over the program. I jumped at the chance. Luckily for me, and many others in the system, the VA has a comprehensive training program for those seeking to work in the field.

I completed my initial training in Tampa FL and started providing driver rehabilitation full time that same year. I was introduced to ADED: The Association for Driver Rehabilitation Specialists (ADED) during my training and attended my first ADED conference in 2008, a novice in the field. This conference was significant to me because although I felt a bit intimidated, I met so many interesting people and learned a lot. ADED has been around since 1977 and there is so much knowledge to gain from the members of this groups. In order to improve my professional skills and advance my knowledge, I made a goal of gaining as much knowledge as possible to better serve our veteran population. To achieve that goal, I decided that I would attend as many trainings and conferences, along with reading as much as possible to improve my skill set within the field.

One thing that I quickly learned in my development as a driver rehabilitation specialist, was the importance of collaboration. Collaboration is something that can be done on several different levels:

- Working with other professionals within your facility to increase their understanding of driver rehabilitation;
- Communicating and working mobility dealers to ensure patients are getting the services and equipment they need;
- Coordinating with the Prosthetics Department and local PVA to ensure that the process moves smoothly from start to finish to provide the best patient experience; and

Networking with fellow driver rehabilitation specialists to discuss the ever-changing technological changes within driver rehab.

While attending the ADED conferences and working towards my goal of increased knowledge something happened that was somewhat of a shock to me. Not only could I be a recipient of the knowledge and training, but I could also be a provider. I realized that I wanted to do more for ADED to increase the awareness of the services that we provided. So, while keeping sight of my goal I began to volunteer with the organization to learn more about the infrastructure and how I could be of assistance. I was very fortunate to have great leadership at both the Memphis VA and The Tampa VA to allow me the time to work in these other capacities. I started by doing small presentations called SOAP box sessions at ADED's annual conference. These are 15-minute mini-presentations offered to about 5 different groups in the exhibit hall. The level of attendee expertise varied with each group. This was my first exposure to others with that same passion and interest in the field that I had starting out in the industry. Attendees would come by after my sessions to "pick my brain" about different applications and issues. It was also at this moment that I realized I wanted to help others the way I was helped starting out in the industry.

In 2013 I moved to the Tampa VA hospital to continue my work in helping veterans. I started my first year working as the seating and mobility specialist for the spinal cord injury department. During that time, I again worked to build many relationships and after a year I moved over to the driver rehabilitation department to continue working on my passion. I was able to pick up where I left off in Memphis and while building on the relationships that I had. I also at that time joined ADED's Finance Committee and it my first glimpse inside look at the executive leadership of the organization. I have been a part of several large leadership organizations and I appreciated the way this organization was run. A year later, I was promoted to supervi-

sor of the Kinesiotherapy Department at my hospital. Being selected for this position helped me appreciate the importance of leadership. It also made me realize I really wanted to achieve a leadership role within ADED.

In 2016, an opportunity came up to start an ADED chapter in Florida, and I jumped at the chance to take the lead. Starting a chapter was not without its challenges but because of the great connections I made over the years the transition was not bad. Again, this position gave me a chance to work with the ADED Board of Directors and further lead me to understand I wanted to lead this organization and help others understand how important it is to have a diverse group of professionals that all are working towards a common goal. In 2019, I was elected to a board position as ADED's President-Elect. This was another step toward my goal. One thing that I realized in being elected was that I have an obligation to ensure those that are just starting in this organization have a sense of family and understand that we are all here to help each other.

I truly believe that the heart of any successful organization is building bridges for the future. I feel like my journey is just beginning and over the years I have meet great people to help me get this far. And the veterans and civilians that we serve will be the ultimate beneficiary of all the success we have.

**About ADED:** ADED – The Association for Driver Rehabilitation Specialists – is a non-profit organization of professionals dedicated to promoting safe, independent driving or community mobility for those with disabilities and the aging. The group provides education, research support, and information to professionals working in the fields of driver rehabilitation, education & training, and transportation equipment modifications. ADED is the only organization in North America to offer a specialty certification program for those interested in becoming a Certified Driver Rehabilitation Specialist (CDRS). Learn more about the Association and the CDRS program: [www.aded.net](http://www.aded.net)

## SITE UPDATE: San Antonio

### QL+ Wheelchair Challenger Project – Portable height adjustable desktop/table

The Audie L. Murphy VA Hospital and the students of the Biomedical Engineering Department at UTSA continue to be in collaboration to provide innovative prototypes to improve the lives of our veterans. The January 2020 challenge is to design a desktop prototype for active wheelchair users.

**Goals:**

- Maximize Activities of Daily Living
- Reduce users need for Assistance
- Improve efficiency in work, self-care, leisure interests
- Modernize the wheelchair use for the New Technology Era

**Desktop innovation requirements:**

- Attractive
- Desk be height adjustable and controllable by wheelchair user
- Low-Weight/High Strength
- The desks are attachable to an ultralight MWC

**Desk Design Description:**

- Made of Aerospace Aluminum (low weight/high strength)
- Double size split use
- Storage under one of the arm rests
- Manual distance adjustment

Prototypes are custom made and issued to the veteran at the expense of UTSA. We are super excited to see what innovations are born of these students.



### Rec Therapy

Audie L. Murphy hosted the 4<sup>th</sup> Annual SAN ANTONIO MILITARY ADAPTIVE CYCLING in March. This three-day

event is organized and run by our recreational therapists in collaboration with our community partner, Operation Comfort. The clinic ran for 3 consecutive days which included education, fitting, and group rides.

### Drivers Training

Drivers Training has become part of the rotation for GRECC/PM&R/and Psychology Post-Doc students at the San Antonio VA. The students have provided feedback indicating how this unique clinical exposure has increased their knowledge base allowing them to make more appropriate referrals moving forward.



### New FTE Approved

For the first time since the opening of the San Antonio Polytrauma, the position of Assistive Technology Program Coordinator was approved; Polytrauma Therapy Supervisor, E. Reuben Rodriguez was selected, and is projected to fully transition into the role beginning May 2020.

### Cool Article

VA Insider; April 2020; *Using technology, San Antonio VA finds a new way to meet Veterans' health care needs in this time of crisis*

Until recently, Veterans who needed to be fitted for a new wheelchair were required to physically go to the Audie L. Murphy Memorial Veterans Hospital in San Antonio, Texas.

In the interest of encouraging Veterans to social distance and prevent potential exposure to COVID-19, Physical Medicine and Rehab Service teamed up with Prosthetics Service to provide an extraordinary care experience to Carl Johnson, a 76-year-old Army Veteran.

Johnson became the first Veteran ever to have his wheelchair delivered to his home and receive a telehealth wheelchair fitting appointment.

"It was great, it was right on time," said Johnson who has amyotrophic lateral sclerosis, commonly known as Lou Gehrig's disease. "I'm just loving it."

From his residence, Johnson, along with a wheelchair vendor, participated in a telehealth appointment with Paul Alonzo, a lead wheelchair technician, and E. Reuben Rodriguez, the assistive technology program coordinator, both located at the Audie L. Murphy Memorial Veterans Hospital.

After Johnson sat in his new wheelchair, Alonzo and Rodriguez gave the wheelchair vendor instructions on how to adjust various parts of the wheelchair. The discussion focused on safety, comfort, and efficiencies.

"They were looking at everything and could actually see what adjustments needed to be made," said Carl's wife, Frankie, who noticed the attention to detail during the fitting. "I think they did it just right."

*"With virtual care, we are able to leverage available technology to make sure that our patients and staff are safe. We want to be able to connect with our Veterans and make sure we get them what they need during this period of time," said Rodriguez (right) with Lead Wheelchair Technician Paul Alonzo.*

As the coronavirus (COVID-19) continues to spread among the American population, Frankie was relieved she and her husband did not have to leave the house. "With the disease that I have, the care I have received at Audie L. Murphy has been excellent and they treat me like I'm their top priority," said Johnson, adding he believes the power of technology holds the key to allowing VA to continuously serve its Veterans.

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 \*\*\* It should be noted that at the San Antonio VA, all wheeled mobility evaluations and fittings are being performed via Telehealth during the COVID-19 outpatient visit restrictions.

# Assistive Technology is a Godsend, cont.

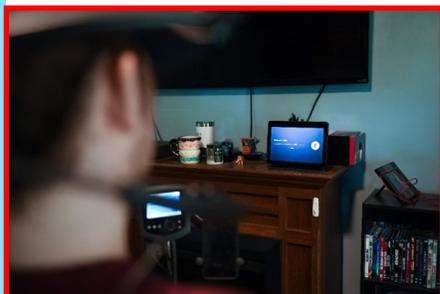
- Input/Output Module (IO/M) for Environmental Control Unit (ECU)
- Input/Output Module (IO/M) for Teclae Bluetooth switch interface for controlling mobile devices from his power wheelchair
- Ring Pro Doorbell system to allow him to monitor the entryway to his home and screen/admit guests



- Customized Wireless Interface with battery backup to allow him to independently access and operate his Bruno Vertical Platform Lift
- Door Opener System with battery backup on first floor (ground level) to allow him to independently exit his home in the event of a fire or emergency
- Mounting equipment for use of his mobile devices and QuadStick adaptive gaming controller in bed or in his power wheelchair (cont. page 13)

- Amazon Echo Speakers for fully-automated smart home system, including:
  - 1) Echo Show with mount for environmental control of his bedroom environment
  - 2) Echo Spot with mount to allow him to monitor his supplies and medication closet and provide audio-visual guidance to caregivers from a remote room
  - 3) Echo Plus for control of his recreational room (on the first floor)

- Logitech Harmony Hub for control of his television and audio/visual equipment
- Wi-Fi, Radio Frequency, and Zigbee smart home products and relays for wireless automation
- Alexa-enabled system integrated with smart home automation components to control the thermostat, appliances, fan, lights, and switches by voice with backup system through his power wheelchair
- Custom Medical Bed Controller to allow bed control by voice
- Door Opener System with battery backup on main level to allow him to independently exit second floor of his home



### Acknowledgements

The Minneapolis VA SCI/D AT Program would like to thank Cooper Tenney for providing consent for use of his name and PHI as well as production and use of verbal or written statements, photographs, digital images, and/or video or audio recordings by VA for publication in this newsletter. Photo credit is due to April Eilers, Visual Information Specialist, Minneapolis VA Health Care System. The Minneapolis SCI/D AT Program would also like to acknowledge Rick Ziller of Adaptive Technology Resources, Inc. for his work and collaboration with our program on this AT implementation.

# Assistive Technology is a Godsend, cont.



**What impact does the assistive technology provided by the SCI/D AT Program have on your quality of life?**

*"The assistive technology is a godsend! It's had a large impact on my quality of life and has completely changed the way I live my day-to-day life."*

**What are some of your favorite technology solutions that you use on a daily basis?**

*"My favorite technology solution so far is definitely the Echo devices. Being able to just speak and have things happen for me is pretty nice. It gave me a lot more peace of mind because I'm not always around somebody. So if there are things that I want or need to get done I can use the technology to accomplish that. Especially at night, if I get too hot or too cold, I can adjust the temperature in the room by myself without having to bother anybody . . . It makes me feel like less of a burden."*

**What would you tell somebody who is just starting out with assistive technology?**

*"I would tell them to be patient, it's worth it. It's going to take a little bit to learn everything, but once you do it's going to feel great using it!"*

**AT Outcomes**

The successful implementation of Cooper's comprehensive AT solutions has allowed him to accomplish the goals that he identified during his annual evaluation and subsequent follow-up appointments with our AT Team. While he is now living more independently than ever before, our program recognizes that his assistive technology needs will continue to change over time based on his changing capabilities, newly identified goals and activities, and emerging contexts where he will need to use his technology, especially as he completes his accounting degree and begins his career search. As part of the follow-up and follow-along process of the AT service delivery model, our team reached out to Cooper to obtain summative feedback related to his use of AT to share with SCI/D providers and veterans.

## 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



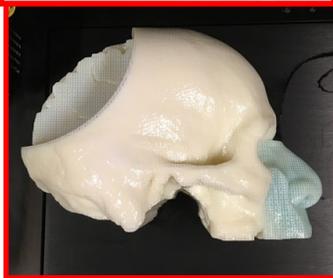
### Creativity Corner from Richmond...John Miller

As usual, our rehabilitation engineers have been coming up with new ideas and designs to implement with our new printers.

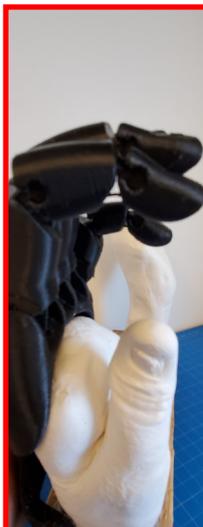
Seth Hills recently updated an old mouthstick stylus mount design for an iPad case by developing two solutions simultaneously. The first solution was a swivel-adjustable magnetic button that an iPad user could stick a mouthstick stylus to, while the second solution was a multi-axial swivel adjustable scoop in which the user could lay a mouthstick. Seth printed both designs in Onyx material, a nylon-carbon fiber blend that has been exceptionally durable and effective for us.

Brian Burkhardt has been leading the way on our program's foray into medical modeling. Recently he collaborated with the VA in Puget Sound to produce a high-quality model of a patient's heart for the Secretary of the VA. Brian is also working with the local neurosurgery department to provide brain/skull models for patients undergoing a craniotomy. The goal of these projects is to better inform surgical decisions outside of the operating room prior to an actual surgery, saving time and reducing risk. Our Stratasys J750 printer is ideal for printing these models, since it can

jet multiple materials and colors at once to build complex 3D printed parts. John Miller worked with a therapist in Alabama who sought a high-visibility wheel lock handle extension for manual wheelchairs. A red color is ideal for patients with Parkinson's disease, while yellow would aid patients with low vision. In addition to making the wheel lock handle easier to see due to its color, having an extension beyond the standard handle makes it easier to pull and push on. John designed a contoured, ergonomic handle and printed it in Ninjaflex, a rubber-like TPU material, providing a sturdy yet softer grip for comfort.



### Veteran Story from Hines....Victor Rivera



AT service and Rehab Engineer contacted by Amputation care team and O&P for co-treatment. Patient has partial hand amputations missing digits 2-5 bilaterally due to frost bite. Amputation care team and O&P service requesting a 3D printed wrist driven prosthesis. There are no products available off-the-shelf or vendors who provide devices for this Dx. O&P found the open source organization "e-NABLE (Enabling the Future)" a non-profit organization dedicated to donating 3D-printed mechanical hands and arms to people in underserved communities around the world. AT service and O&P are currently fabricating a prototype for this patient.

