Assistive Technology Screening

Date(s): 3/15/06 – 4/7/06

GENERAL INFORMATION

Client Name: Michael
Address: 4444 West River Dr, Somewhere, VA 55555
Phone: (111) 453-8713
Date of Birth: mm/dd/yyyy

Contact Name: Mrs. Angela
Relationship: Mother
Phone: (111) 453-8713

Contact Name: Ms. Sara
Phone: (111) 345-2341
Relationship: Case Manager, Brain Injury Services

Reports Reviewed: Neuropsychological Evaluation (2/28/05)
Short Term Rehabilitation Unit Interdisciplinary Team Discharge Report (11/12/04)
Speech-Language Pathology Empowerment Through Communication Program Discharge Report (5/27/05)

DESIRED OUTCOMES

Goal: To provide suggestions for assistive technology that will help Mike to access and use computer independently.

CURRENT STATUS

Diagnosis: Traumatic Brain Injury

Current Services: Speech, PT, OT

Abilities:
- Spells words correctly
- Enjoys working on the computer
- Has no memory loss
- Highly motivated
- Independently utilizes the Vanguard II
- Independent in household mobility through the use of a manual wheelchair

Challenges:
- Severe ataxia
- Ataxic and dysarthric speech (single words)
- Limited mobility (requires the use of a wheelchair)
- Visual deficits (states that he has double vision)

BACKGROUND INFORMATION

Michael (Mike) is a 45 year-old male who sustained a traumatic brain injury on 4/14/03 as the result of a motor vehicle accident. Based on the medical history provided to this team by Ms. Sara (Case Manager, Brain Injury Services), Mike was in a coma for 10 weeks after his injury and was transferred to Cameron Glen Skilled Care Facility. Upon regaining consciousness, he was transferred to an inpatient rehabilitation program at INOVA Mount Vernon Hospital and has had two subsequent short-term inpatient rehabilitation stays at Woodrow Wilson Rehabilitation Hospital (Fall 2004 and Spring 2005). He currently attends physical therapy (2x/wk), occupational therapy (2x/wk), and speech therapy (1x/wk) treatment sessions at an outpatient facility. Mike also goes to the ADAPT Clubhouse, a day treatment program designed to help individuals with brain injuries lead a productive life, two days a week.

The following items are summaries of 2 medical reports, which provide insight into Mike's rehabilitation progress and overall level of function.

Woodrow Wilson Rehabilitation Center Team Discharge Report (11/12/04): Mike participated in Woodrow Wilson's inpatient Comprehensive Rehabilitation program for approximately two months. During his admission he received occupational, physical, and speech therapies, which were focused on maximizing Mike's level of independence and educating Mike on compensatory strategies/equipment that would aide him in his activities of daily living. Based on the information in the report Mike's strengths at the time of discharge included: transfers (to/from car, couch, toilet, and tub bench) with supervision and occasional verbal cues; independence with propelling his wheelchair in his house and for distances less than 1000 feet; independence with feeding after set-up (supervision to ensure safety with swallowing); independence with grooming after set-up; independence with dressing through the assistance of a dressing hook; independence with simple house cleaning, laundry, and money management; ability to read large print books; and the ability to use a telephone with raised keys. Mike's receptive language was intact, however he demonstrated severe limitations with expressive communication. He benefited from the use of an alternative augmentative communication (AAC) device and it was highly recommended that he use a device for communication. Mike also received Computer Accommodation Lab Evaluation (CAL) during his admission. Based on the results of the CAL evaluation it was determined that in order for Mike to independently utilize a computer he would need an onscreen keyboard, trackball, and forearm support.

Woodrow Wilson Rehabilitation Center Empowerment Through Communication (ETC) Discharge Report (5/27/05): The ETC program is a two-week intensive group treatment program for adolescents and adults who utilize speech-generating devices. The program focuses on supporting users to become competent communicators with their devices. Based on the information in the discharge report, the program resulted in an increase Mike's ability to efficiently utilize the Vanguard II. Mike's speed and comfort level with using the device dramatically increased. Mike also learned to accurately utilize the word prediction feature and how to program messages independently. Mike benefited from exposure to other

AAC users and his level of comfort increased. Overall, Mike demonstrated significant improvement in communicative competency utilizing his Vanguard II. However, it is important to note Mike's motivation for using the device dramatically decreased once he was discharged from the program.

INTERVIEWS

Case Manager: (3/15/06)

Sara Sharifi has been working with Mike for over a year and is very knowledgeable about his case. Ms. Sharifi provided our team with information into Mike's life prior to the accident, recovery process, current status, and goals. The following information was gathered through a face-to-face interview with Ms. Sharifi.

Mike is a lifelong resident of the Northern Virginia Area and has 4 siblings. He is divorced and the father of 4, however he has very little contact with his children. He earned his Associates Degree in Radiology from Northern Virginia Community College in 1978. Prior to the accident, Mike was living alone in a condominium (which he still owns) and working full time as a Radiology Technician. Mike was very knowledgeable in his professional field and served as a clinical instructor to radiology students. Mike retains knowledge from his professional life, and recalls all of the special terms and clinical jargon related to his previous work.

Since being discharged from the hospital in November 2003, Mike has lived with his mother (Mrs. Angela) in her duplex home in Somewhere, Virginia. Ms. Angela serves as Mike's primary caregiver and is very dedicated to the care of her son. However, she is 80 years-old and a long term solution to Mike's living situation is currently being explored. Ms. Angela accompanies Mike to his therapy appointments and provides Mike assistance with his activities of daily living as needed.

Mike requires the use of a wheelchair to assist him with mobility. He continues to receive speech therapy, occupational therapy, and physical. Mike's current areas of concern include severe ataxia in his upper extremities; thus, he is unable to perform fine motor movements. He also has ataxic and dysarthric speech. He is able to pronounce only single words although with a great effort and is very difficult to understand by an unfamiliar listener. He currently uses the Vanguard II by Prenkte Romich communication device. The Vanguard II has some pre-programmed messages and he also uses a feature on the device that allows him to spontaneously type messages. Additionally, Mike benefits greatly from the word prediction software, which is loaded onto his communication device. Word prediction significantly reduces the number of keystrokes but it still laborious task due to his ataxia. While Mike is independent with using his Vanguard II to communicate, he admits that he prefers not to use it.

Per report from Ms. Sharifi Mike's goal is to live independently, but he realizes that he would need support. Mike has the desire to fulfill his dream of independence and actively participating in a variety of programs offered through the ADPAT Clubhouse including community outings and writing articles for ADAPT's newsletter. Mike utilizes a standard computer at the clubhouse,

however due to his physical limitations typing on a standard computer is very laborious and time consuming. Ms. Sharifi provided our team with a copy of a one story that Mike wrote about his accident using a computer at ADAPT. While the paper was well written and gave us insight into Mike's cognitive skills, Ms. Sharifi informed us that it took Mike over 4 weeks to write the paper. Ms. Sharifi believes that given Mike's high level of skill with using his Vanguard II, ideally he would be able to use the device as an adaptive keyboard and/or mouse.

Mother: (3/27/06):

Ms. Angela graciously invited our team into her house in order for us to interview her and her son Mike, and to allow us a glimpse of Mike in his home environment. After a brief introduction and explanation of our team's goals, we asked Ms. Angela to describe her son and the technology that he currently utilizes. Ms. Angela told us about Mike's abilities and his challenges. She believes that her son has made many gains since his accident, but she wishes that he was able to receive more therapy and gain more function. She informed us that she accompanies to all of his medical appointments, however she does not accompany him to the ADAPT clubhouse. Mike travels to his appointments primarily by Metro Access. In her opinion, Mike's greatest need surrounds improving his communication skills. She stated that he has made gains in terms of communication, but even as a familiar listener she often has trouble understanding her son's speech.

When we inquired about Mike's communication device, Ms. Angela told us that even though Mike has owned the device since November 2003 they have had many difficulties implementing the device. In her opinion Mike did not receive enough training and she was not trained well in caring for the device (surrounding programming). She also stated that she does not feel comfortable using such a sophisticated device and she had hoped more support would have been provided once the device was purchased. Unfortunately, the device was damaged when it was accidentally dropped requiring it to be sent back to the manufacturer. When the device was returned to Mike, all of the custom pages that had been programmed manually were erased. In general, Ms. Angela has not been impressed by the Vanguard II, but she supports Mike using it if it helps him communicate.

Ms. Angela also gave us a glimpse into Mike's past and his goals for the future. She believes assisting Mike with computer access will allow Mike to use the computer more. She is also interested in purchasing a laptop computer for Mike, because at this time he does not have access to computer except when he is at the ADAPT Clubhouse.

Mike (3/27/06):

After a brief discussion with Ms. Angela, she called Mike into living room to join our discussion. When we arrived at the house Mike was watching television in the backroom. Once his mother requested him to come into the living room, Mike independently turned off the television and propelled himself through the kitchen and dining room into the living room. He had some minor

difficulties maneuvering around some furniture in the dining room, but for the most part he appeared to be independent in house mobility. Upon entering the room, Mike greeted us by saying "Hello." His mother set up his communication device on the coffee table and Mike quickly navigated to a pre-programmed message, which stated, "I'm blessed, thankful, and happy. I have a great attitude. I'm glad to work with people from GMU."

When asked, Mike confirmed that he usually uses his device with unfamiliar people, but he rarely uses it when communicating with his mother and other relatives. It was very clear that Mike's receptive language was within normal limits and he was able to comprehend everything that was being discussed. Mike had difficulty answering questions at an average conversation rate of speed, and informed us that he prefers answering "yes" and "no" questions. He informed us that he frequently uses pre-programmed messages to communicate and he has had experience in independently programming the device (he was trained during his last admission at WWRC). He is also able to type spontaneous messages and is independent with navigating from board to board on the Vanguard II. Throughout the conversation, Mike stated that he was satisfied with his communication device and felt comfortable using it.

We provided Mike with a description of our project and told him a little bit about our backgrounds in relation to Assistive Technology. When we asked Mike what he would like to be able to do at the conclusion of this project he utilized his communication device to say, "I want to be able to use a computer more easily." He informed us that he enjoys using the computer at the ADAPT Clubhouse, however he does not use an adaptive keyboard or mouse. He currently types using the hunt and peck method with two fingers, and expressed that this method is very difficult.

Based on the initial interview, Mike appeared to be very excited about working with our team. Mike and his mother thanked us, and stated that they both were looking forward to meeting with us at the ADPAT Clubhouse.

OBSERVATIONS

Observation 1: (3/27/06)

As stated above in the "Interview" section our first meeting with Mike occurred at his mother's house on the evening 3/27/06. Prior to our first meeting with Mike, our team met with Ms. Sharifi (Brain Injury Services, Inc.) to gather background information. Based on information provided Ms. Sharifi, Mike's primary interest surrounded computer access. He currently does not have access to a computer at his mother's house, but he does at the ADATP Clubhouse. After extensive review of the background information provided by Ms. Sharifi, our team decided to bring The Mercury (Assistive Technology, Inc.), a portable computer that runs on Windows XP operating system. The Mercury includes a touch screen and USB ports that allow compatible input devices (i.e. mouse, keyboard, trackball, etc.) to easily be utilized. We also chose to bring a standard mouse, standard keyboard, and the SAM Trackball mouse.

We met Ms. Sharifi at Ms. Angela's house and both were active participants in our discussions with Mike. Our session took place at Ms.

Angela's dining room table. Mike was seated in his manual wheelchair that he uses for mobility at home. He was seated at the appropriate height for accessing items placed on the table in front of him and did not present with any issues with his seating and positioning.

Mike greeted us initially by saying "Hello". His speech was very difficult to understand and Mike was aware of his limitations. He subsequently used his communication device (Vanguard II) to answer complex questions and express his thoughts. Mike was proficient with utilizing pre-programmed messages and typing spontaneous messages using WordPower (software program on the Vanguard II that allows the user to type) with word prediction. It was noted that even though Mike was able to express his thoughts through the use of WordPower, it was very time consuming and laborious. Mike was able to independently navigate to and from screens of his choice. In addition to the communication device, Mike had a keyguard (84 location) and a mount for his wheelchair that he uses in the community. Mike expressed that due to his motor limitations, it was extremely difficult for him to access the Vanguard II without the keyguard in place.

After we became acquainted with Mike, we explained the purpose of our project and asked Mike how he thought we could help him. Mike immediately responded via typing a message with his communication device, which stated that he would like us to assist him with accessing the computer. To the best of her ability, Ms. Sharifi described the computer equipment available for Mike to use at the ADAPT Clubhouse. Based on Ms. Sharifi's description, the computers are recent model Dell brand standard computers with a Windows operating system and no adaptive equipment is available at this time. However, the staff at the ADAPT Clubhouse would be receptive to implementing adaptive equipment into their program.

Per request from Ms. Sharifi, we discussed the possibility of Mike using his Vanguard II to interface with a computer serving as an adaptive keyboard and a mouse. Mike expressed a high level interest in exploring the option and quickly located a computer access page that had been pre-programmed into his Vanguard II. Mike informed the team that he had found the computer access pages while exploring the features of the device, but he had not had experience using the pages. Ms. Angela provided us the original manuals and cords for the Vanguard II, so that we could explore the possibility of connecting the device to a computer. Unfortunately, the Prenkte Romich support desk was closed and we were unable to determine if Mike's device had the ability to interface with a computer. We informed Mike that we would contact the company to inquire about using the Vanguard II with a computer and report our results at our next scheduled observation.

In an effort to determine Mike's baseline level of computer skills with a standard computer, we brought the Mercury (portable computer and communication system) by Assistive Technology Inc. Mike eagerly demonstrated his typing skills initially. It was noted that used a labored hunt and peck method with two fingers to type on a standard keyboard. Mike also demonstrated difficulty manipulating a standard mouse. Mike was then introduced the Microsoft Accessibility features including the onscreen keyboard

and ability to change the speed of the cursor. Mike was presented with SAM Trackball and instructed in how to use it. Mike understood the concept of the onscreen keyboard and was receptive to using it, however the standard Microsoft onscreen keyboard was extremely small and Mike reported that it was difficult to see the cursor. Mike also had difficulty using the SAM Trackball. Based on the results of the first meeting with Mike, we determined that it was essential that we observe Mike at the ADAPT Clubhouse and we conduct trials on the computers at the clubhouse. We also decided that we would try a larger onscreen keyboard, a couple of joystick mice, and using his Vanguard II with the computer during our next observation.

Observation 2: (3/31/06)

Our second observation occurred at the ADAPT Clubhouse at the end of Mike's day, around 3:00pm. Mike, Ms. Angela, Ms. Sharifi, and clubhouse staff met our team in the computer room at the clubhouse. We were informed by the staff that they were not familiar with Assistive Technology or computer access. However, they do enlarge the font size and screen size to assist some of the attendees with visual difficulties, including Mike. Ironically, when we asked Mike what he had done at the clubhouse that day he informed us that he had spent a good part of his day typing an article on the computer for the clubhouse newsletter. He expressed that he was tired and had worked very hard, but as with everything else Mike said that he is used to adapting and working through challenges.

We asked Mike to choose one of the computers that he typically uses and briefly demonstrate how he accesses the computer. It was very evident that accessing the computer is very challenging for him. Once we established that using a standard computer and mouse was not appropriate for Mike, we quickly moved on to the adaptive hardware and software. After receiving consent from the clubhouse staff, we downloaded the WiVik onscreen keyboard and a free trial of the Biggie Cursor program. Mike believed that the cursor was much easier to see and he was able follow it on the screen. After a brief explanation of the onscreen keyboard software, Mike agreed to trial it. Initially, Mike was frustrated with the onscreen keyboard, because he was having difficulty understanding how to use it. Eventually he understood the concept and determined that if the onscreen keyboard was made to be half the size of the computer screen, he was able to use it.

We also gave Mike the opportunity to trial a couple of different adaptive mice. Mike was very motivated to use the trackball and even though he did not have great success with it when he trialed it at his house, we allowed him another chance to try it. Unfortunately, due to his ataxia it was extremely difficult for him to use the trackball and we ruled out the trackball as a potential solution. Mike was next presented with RJ Cooper Sam Joystick. The joystick was easy for him to manipulate and move the cursor, but the buttons were located on the base of the joystick. The location of the buttons led to Mike activating the buttons unintentionally. Even though the size of the joystick was suitable to Mike, the location of the buttons made this device difficult for Mike to use.

After contacting the Prenkte Romich Company, downloading the appropriate software, and setting up the computer with the assistance of the help desk. Mike was receptive to using his communication device to access the computer. The Vanguard II has two computer access pages already downloaded on the device, which can act as a keyboard and mouse. Mike demonstrated the ability to use the device as a keyboard and mouse; however he required maximum verbal cues to remember to look at the computer screen to see what he has typed. We concluded that Mike was having difficulty comprehending that this communication was the keyboard and the information he was typing was on the screen. It was also determined that in order to increase Mike's success with using the Vanguard II as a keyboard and mouse, he would need to have a keyguard.

Throughout the observation Mike appeared to be fatigued and asked to go home. We believe that due to this fact Mike was resistant to using the adaptive device for an extended amount of time. At the conclusion we sat down with Mike, Ms. Angela, Ms. Sharifi, and a clubhouse staff member to discuss the our observation. We explained all devices we trialed and our impressions. We also asked Mike to provide us with his feedback. He said that he liked all of the devices and programs we showed him but he preferred the joystick and onscreen keyboard. Although it was difficult for him to use his Vanguard, he mentioned that it would be good to use one device for communication and computer access.

RATIONALE AND SUGGESTIONS

Assistive technology continues to support individuals with disabilities providing them with greater independence. Several different hardware devices and software programs can assist people with physical difficulties to access and successfully use a computer. It is critical to make sure that the suggested technology is the best fit for person's needs, abilities and skills that depend on the task for which technology will be used.

The purpose of this report is to observe client's operating a computer and suggest possible alternative access methods. It is assumed that the client will access a computer at the clubhouse at first. Furthermore, he is considering purchasing a laptop to have an access to a computer any rime. After careful consideration, taking into account client's preferences the following devices and software programs are suggested. However, selection of a single device and/or a software program should be left for those working directly with a client. It is suggested to make such decision after an extensive trial period.

Vanguard II

It was Mike's biggest wish, supported by comments of people around him, that the best way to access a computer would be to use existing communication device. Thus, it is suggested to consider Vanguard II as the primary access method. This device has built in keyboard and mouse overlays.

Mike was generally successful in touching keyboard and mouse keys and making selections on his device. He had some difficulty with getting used to looking at the computer and not at the message window. However, with some practice he should easily gain proficiency. Mike expressed that it was difficult for him to use the keyboard and mouse layout without the keyguard. So it is suggested that he will benefit greatly from using one. The special keyguard for the keyboard and mouse layouts can be purchased from the Prentke Romic Company. For more information go to: http://www.prentrom.com

Vanguard II 45-Location Keyguard ……..$ 135.00

In order to use his communication device as a keyboard and a mouse, it is necessary to download software from Prenkte Romich's website and to have the MTI Cable (this cable came with the device). Once the AAC Tool software is downloaded onto the computer and the device is connected to the computer the Vanguard II can act as a computer or mouse. Setting up this system is relatively simple; however it is recommended that the individual setting this system up contact the Prenkte Romich technical support (800-262-1900) desk to be walked through the process.

PROS	CONS
▪ Allow Mike to access computer with the familiar device	▪ Cost of keyguard for a keyboard and a mouse layout
▪ Encourage Mike using his device more often	
▪ All features of Vanguard communication device (including word prediction) transfer to the computer access	

WiVik Onscreen Keyboard

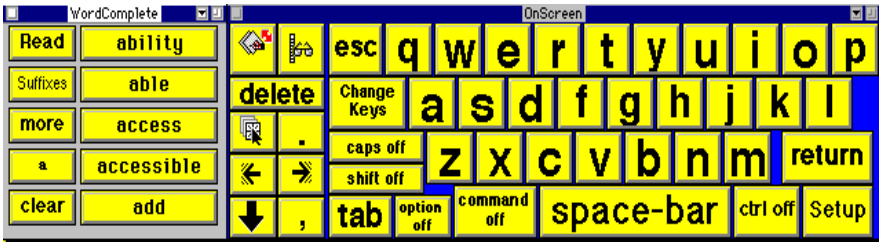
WiVik onscreen board provides an access to Microsoft Word and other applications alternative to a standard keyboard. You can type in word, access email and web pages with it. WiVik onscreen keyboard also provides speech feedback and word prediction features. Information for the IntelliKeys can be found at: http://www.wivik.com

……..$ 350.00

PROS	CONS
Works with different applications	Cost

Great features: click or dwell, word prediction, speech feedback, etc.	May not be an option if vision continues to decrease
Can be resized	

OnScreen Keyboard for Windows



OnScreen keyboard for Windows from RJ Copper can also be used with different applications: word, email, Internet. It has similar features. You can change and color and size. It has speech feedback (so it talks to you). However, OnScreen keyboard has Word Complete feature (not word prediction). That means that it only tries to complete the word you are typing not predict it ahead. Mike uses word prediction very successfully with his communication device. It may be difficult for him to differentiate between two so similar but yet so different functions. Learn more about OnScreen Keyboard for Windows at: http://rjcooper.com

……$ 109.00

PROS	CONS
▪ Cost	▪ Word complete tries to complete the word you type not predict it ahead
▪ Has speech feedback and word complete	▪ May not be an option if vision continues to decrease
▪ Can be used with different applications	
▪ Scrolls left and right when oversized (just pin your cursor against an edge)	

BIGGY

Some people with low vision have difficulties seeing a cursor. That prevents them from using a computer successfully. BIGGY software provides ultra-visible cursors for all programs. It has a great choice of animated or just significantly oversized cursors so everybody can find one they like. BIGGY comes with an option of sounds for all activities (clicking, dragging, etc.) It works with joystick. Learn more about BIGGY at

http://rjcooper.com

……..…$ 109.00

BIGGY Light (with less cursor options) ……..$ 29.00

PROS	CONS
▪ Allows Mike see cursor, use mouse and onscreen keyboard	▪ None
▪ With limited cursor options is low cost	

Windows Accessibility Features

Microsoft Windows has accessibility features build into, which make a computer easier and more comfortable. Windows includes a wide array of options to increase visibility of items on the computer screen. Some options that Mike can benefit from and that can be adjusted include: Microsoft magnifier - enlarges portion of screen for better visibility; Cursor width and blink rate - makes the cursor easier to locate, or eliminate the distraction of its blinking; Screen resolution - change pixel count to enlarge objects on screen. The accessibility tutorials can be found at http://www.microsoft.com/enable/.

PROS	CONS
▪ Allows Mike see screen, documents, text, cursor, and onscreen keyboard	▪ Features are pre-designed and can not be resized or adjusted
▪ Built in feature (no additional software or hardware is necessary)	

SAM – Joystick

SAM-Joystick allows people with physical disabilities perform mouse functions while pushing the stick around. The speed of the cursor movements is controlled by accompanied software. It has programmable buttons for left click, double click, right click, and drag on the base. However, buttons are not protected by a guard and can be activated accidentally. It is very easy to connect this device to the computer. Simply plug joystick into USB port. Find more information about SAM – Joystick at: http://rjcooper.com

PROS	CONS
▪ Easy to plug in	▪ Needs additional software to work
▪ Programmable buttons	▪ Buttons are not protected (can be activated accidentally)
▪ Controllable speed	▪
▪ Relatively low cost	▪

Penny and Gile's Roller Plus

Penny and Gile's Roller Plus is available with a 30-inch joystick. It has 6 programmable buttons that control left, right, double click, drag, horizontal and vertical lock as well as speed control. It includes the keyguard that separates the keys and provides hand rest and support.

……...……..$395.00
(http://www.infogrip.com/product_view.asp?RecordNumber=103)

PROS	CONS
▪ Speed control is on the device (software is not required)	▪ Cost
▪ 6 speed levels	
▪ Programmable buttons	
▪ Keyguard prevents accidental activation and provides hand support and rest	

PLEASE NOTE

Advances in technology are being made at a rapid rate. To assure that Mike continues to access computer successfully with existing technologies as well as have the opportunity to benefit from future technology, assistive technology screenings and evaluations should be on-going. Indicators for such reviews maybe when progress and/or motivation shows signs of distress.

Respectfully submitted by:
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