Assistive Technology Screening

GENERAL INFORMATION

Client Name	Dr. Dennis	Contact Name	Dolores
Address	1111 Elm Ct.	Phone	(333) 473-4839
	Fairyland, VA 20000		
Phone	(333) 546-8372	Relationship	Service Provider, Area Agency on Aging Nutrition Program
Date of Birth	mm/dd/yyyy		
Contact Name	Mrs. Marcie		
Relationship	Wife		
Phone	(333) 546-8372		

Reports Reviewed: Virginia Uniform Assessment Instrument (2/14/2006)

DESIRED OUTCOMES

Goal: To provide suggestions for alternative (one-handed) keyboards and other assistive technologies that would provide support and more independence to Dr. Dennis in computer access, reading, and writing/spelling.

CURRENT STATUS

Diagnosis: Cerebral Vascular Accident (CVA) - Dr. Dennis had a stroke in 2002, which has left him with impaired mobility and speech; epilepsy (controlled by medication)

Current Services: group speech therapy once a week at the Stroke Center at GWU; OT

Abilities:	Challenges:
Independent inside the house	Has total paralysis of right arm and partial paralysis of right leg
Has no memory loss	Expressive aphasia
Alert and oriented, great attitude	Difficulty reading and writing
Uses AT and looks forward to more	Needs mobility support outside
Has several hobbies	Cannot continue with his hobbies
Physically active	Learns to do everything with left (previously non-dominant) hand

INTERVIEWS

<u>Mrs. Dolores</u>: (3/16/06) Dr. Dennis, 57 years old, has a PhD in biochemistry. In 2002 he had a stroke, which caused a total paralysis of the right arm and a partial paralysis of the right leg. In addition, he complains of sensation loss on the right side of his face. Dr. Dennis has impaired speech – expressive aphasia. He has some difficulty expressing his ideas but nonetheless is relatively easy to understand. He has a brace on his right leg and uses his left arm/hand (previously non-dominant) for everything. As stated in the Virginia Uniform Assessment Instrument, he needs mechanical help for bathing, transferring, stair climbing (railing), and mobility. However, he does not need human help inside the house. He is able to use the phone but has some difficulty due to his speech. He usually does not pick up the phone if he does not recognize the number from the caller ID. Dr. Dennis has no memory loss and remembers his work related vocabulary. He retired after the stroke and now receives social security disability insurance. He lives with his wife in a very nice neighborhood. Dr. Dennis has great supports. He has a 22 year-old-son who is currently not living at home. His wife works full-time but is home all evenings and weekends. He is alone at home all day. For that reason, Dr. Dennis gets Meals On Wheels 5 days a week. His wife wants him to be as independent as he can be. She now manages all IADLs. Dr. Dennis is alert and oriented. He currently uses some assistive technology (AT): lift chair, power chair, jar openers, reacher, and books on tapes. He always shows his assistive gadgets to others and looks forward to getting more. Dr. Dennis is very excited about this project and very motivated to try different technologies.

<u>Dr. Dennis</u>: (3/22/06) Dr. Dennis met at the door and expressed his excitement about the project. He told about himself and showed around his house. As Dr. Dennis said his wife researches low-tech assistive technology online. He currently has a jar opener, a reacher, a lift chair, power chair and books on tapes. He can operate in the kitchen with appliances they currently have (pots with handles, etc.) but does not want to cook every day (lack of motivation not abilities). He says he does not need any other service but Meals On Wheels when his wife is at work.

Dr. Dennis says that now it is hard for him to read because while he remembers individual letters, they are mixed up when he is reading or writing. The same is true with numbers, so it is difficult for him to write down new telephone numbers. He has a huge library of DVDs, VCR tapes, and books (300-400), the majority of which are fantasy. Unfortunately, he cannot read them unless they are available on tapes through the Library for the Blind. He states that he is comfortable with the choices he can order on tapes (US News, World Report, variety of books, etc.). He rents them from the Library for the Blind through the Government Center and can keep them for as long as he wants. He usually gets about 10 books at a time.

Dr. Dennis used to have a lot of hobbies. He did a little bit of everything: mosaic, fantasy sceneries for which he had to paint miniature figures, etc. He told us that he loved to work with different power tools. He did everything around the house and outside. However, he unfortunately cannot do that any more with one arm. Now his hobbies are watching DVDs and making jigsaw puzzles (most of those are also fantasy). He makes the puzzles and then either takes them apart or gives them to his friends.

Dr. Dennis used to be very physically active. The sports he used to participate in include cross-country skiing (for 30 years), swimming, biking, bowling, diving, and

parachute sport. Even now he swims with one arm. He says that in the summer he swims 10 laps, 5-6 times a week (2-3 times a week in the winter). He walks 0.5 miles to get to the pool. It takes him a long time because he walks slowly. In addition, there is a hilly area on the way to the pool that makes it more challenging. That is why he now uses a power chair to get to the pool and to other distant places.

Dr. Dennis mentioned that he used to be very proficient with computers. He used to have 3 computers at home. He showed the one computer in the study that, as he noted with sadness, belongs to his wife now. He says that it is easy for him to use the mouse but hard to use the keyboard with just one (left) hand. In addition, he says he cannot really type because he cannot spell words correctly.

Dr. Dennis used to play computer games and even now plays those that can be accessed with a mouse. He told us that he used to play Bridge. He mentioned that he was not playing at the time but was going to try some time in the close future. He was reading a Bridge book trying to remember/learn more tricks. When asked how hard it was for him to read, Dr. Dennis mentioned that he looked at pictures and also was able to read a little text.

Dr. Dennis told us a bit more about his job. He worked at Dynotech Company. His job included some research; work on the computer as well as training/teaching company employees in other countries. He traveled a lot around the world: England, Finland, and other Western Europe countries.

Telephone conversation (3/28/06): In order to set up a time for the interview with Mrs. Marcie, the assessor (Anna) called their home number one evening. She was trying to call as late as possible to make sure Mrs. Marcie was home from work since it was the first time Anna had called them and Dr. Dennis does not pick up the phone when unfamiliar numbers are displayed. Nonetheless, Dr. Dennis picked up the phone. He recognized Anna's voice and told her that his wife was out of town for a vacation and when she would be back. While he was speaking in short phrases it was very easy to understand what he was trying to say. He suggested Anna call at a different time and mentioned their meeting the following week. It was truly an impressive conversation.

Mrs. Marcie (4/6/06): The interview with Mrs. Marcie was conducted over the phone. From the very beginning she stated that she would do anything to help her husband to be more independent. She mentioned researching AT devices online but also expressed that she could benefit from more information. When asked about possible areas of need for her husband, Mrs. Marcie brought up computer access as the primary area. She explained that Dr. Dennis is a very bright and intelligent person but after the stroke he feels somewhat awkward around the computer due to the difficulty with spelling and reading. However, he is very eager to work on the computer and can benefit from some technology to help him search the Internet, read, spell, and type Word documents and email messages. From this interview we learned that Dr. Dennis can be impatient and gets frustrated fast. He goes to a reading group at the Stroke Center and has often quit his assignments complaining that he cannot read.

Mrs. Marcie also stated in the interview that she would like to set up a workbench for her husband in the basement where he would have all devices needed for his hobby. That way, he would have easy access to painting the miniature fantasy figures and could possibly even do it independently. Another area where Dr. Dennis can benefit from using

AT, according to Mrs. Marcie, is outdoor/sport activities so he can return to a more physically active life style.

OBSERVATIONS

Observation 1: (3/22/06) Dr. Dennis was observed in his house. It was Wednesday afternoon from 2:00 till 3:30 pm. At this time, Dr. Dennis was in the process of completing a puzzle in the living room. It was a huge 1000 pieces puzzle. He was doing it on the coffee table in the living room. It was very convenient because the top of the table was lifted to be on the level of a dining table. He sat on the coach while working.

Over the time of observation there were only a couple of moments when Dr. Dennis could not completely express himself and gave up. In one of these instances, he was telling about his job so we could not cue him. It is important to mention that when he takes couple seconds to slow down and think more carefully, he can find and say the word in approximately 80% of the time.

There are 3 bedrooms upstairs in the house. It was hard to evaluate the location of the furniture in the house because of the remodeling process at the time of observation. They are painting three rooms in the house. The table in the living room from LZ-boy is on wheels so it is moved easily. Dr. Dennis had rails installed on both sides of the stairs leading to the second floor and to the basement. He holds on the rails with his left hand regardless of which direction he is going. However, it is still challenging for him to walk upstairs and downstairs. There are also rails in the bathroom.

Besides railings, there were other assistive technology devices that Dr. Dennis currently uses. They include a jar opener with sucked cups to be stable on the table surface (he uses it for different products: juice jars, unwrapping DVDs, etc.), reacher, lift chair from LZ-boy that lets him to get up easily, power chair for going long distances, cane for walking on short distances and plastic cover on the carpet in the dining area under his chair. He also showed an opener from Black and Decker to open screw on caps, but he stated that he does not use it very often. Dr. Dennis demonstrated his books on tapes collection. He also showed a "child phone" as he calls it, where he has 4 telephone numbers programmed (his wife cell phone number, her work number, and Metro access number).

Although Dr. Dennis's wife was out of town for a week during the observation, it was impressive how tidy everything was☺

Observation 2: (3/24/06) During the second observation, Dr. Dennis showed how he operated the computer and went into more details about his hobby. It was very early in the morning and Dr. Dennis seemed to have more difficulty speaking. However, he did not want any help. When asked about the nature of his previous job, he could not find words to explain it but did not give up. He spent several minutes trying to figure out how to explain it and at the end was able to come up with a satisfying answer. He remembered that the observer was from Russia and that Russian metric system had centimeters and millimeters. After that he was able to reason further until he reached the correct response. He was very excited when he was able to explain it.

Dr. Dennis showed the study and turned on the computer. He demonstrated that he had no difficulty using a right-handed mouse with his left hand. He mentioned that he

used to have a right-handed mouse, which had a curve and obviously did not work for left-handed access. His computer runs Windows XP operating system. He has a scanner and a printer. When asked to type something, Dr. Dennis demonstrated how challenging it was for him to hunt and peck the correct keys with his left hand. He had difficulty pressing Shift and a letter key at the same time. He said that it was "very inconvenient". Moreover, he commented that while it was easy for him to type familiar words, he could not spell more difficult ones. He showed a list of words (most of them were fantasy themed products: book titles, puzzle names, etc.) that his wife spelled for him on the paper. That was the only way Dr. Dennis could search for topics he liked on the Internet. Furthermore, even when the desired information and/or products were found, he was able to read only a short description and this with great difficulty. Dr. Dennis expressed the wish of finding a technology that could help him type on the computer using simple word processing features, email and Internet searches.

After that, Dr. Dennis showed his work place in the basement where he used to paint tiny fantasy figures for creating sceneries. He showed the special magnifying glasses required for such miniature work. He explained the process of painting, mentioning the use of several different size brushes. He expressed an idea that now, with just one hand, he would have to have something to hold the figures.

When asked if he needed any additional support in the bathroom, Dr. Dennis replied negatively. However, he stated that if shown other supports that are available, he would consider them.

At the end, Dr. Dennis showed his inline skates and told how he had taught his neighbor to skate the day before. He had all required equipment. However, stated with some sadness in his voice, that he no longer is able to do many other things he used to do.

TRIAL ACTIVITIES

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Trial Set-Up: (4/5/06) Over the period of more than three weeks, Dr. Dennis was given an opportunity to try several different software programs with word prediction and text-to speech features. He also received three different alternative keyboards for one-handed access. Dr. Dennis was introduced to each keyboard and each software program and received the training necessary for the successful trial. He was asked to use each keyboard and computer program for a period of time ranging from five to nine days. It was suggested to use both keyboards and programs to type using a word processor, Internet and/or email. In order to build purposeful activities around trying out the keyboards, Dr. Dennis was asked to email Anna as well as his wife and other relatives using word prediction programs. He also received Writing with Symbols 2000 software that allows writing by simply selecting pictures and symbols. That program was provided to use in case word prediction features were too difficult and he could not choose the words from a predicted list. The hardware/software packages used are outlined below including the type of assistive technology and the reason for the trial.

AT Name	Type of AT	Reason for Trial
1. Dvorak keyboard 2. Gesture keyboard 3. BAT keyboard	Alternative (left-handed) keyboard	To see whether or not an alternative (specifically designed for left-handed access) keyboard will increase Dr. Dennis's typing speed as well as improve fatigue.
1. Text Help: Read and Write 2. Co:Writer 3. WordQ	Word prediction software	To see whether or not Dr. Dennis will be able to spell and work in different applications (email, word, etc.) more easily by having the computer to predict words to be typed.
1. Writing with Symbols 2000	Word and symbol processor	This program utilizes pictures/symbols for easier writing/word selection. It is provided as a back-up writing tool in case word prediction feature is too difficult for Dr. Dennis.
1. Dragon Naturally Speaking	Voice Recognition Software	Voice recognition software was trialed upon Dr. Dennis's request to consider it as an option for writing. In some cases voice recognition is a great tool because it transcribes everything read out loud into text. However, it is not appropriate for everybody.
1. Text Help: Read and Write 2. Read Please 3. Windows Word 2003 feature	Text-to-speech (document reading) software	To see if Dr. Dennis will benefit from and enjoy specific books, documents and/or websites by listening to the computer reading those books, etc. out loud to him.

Observations and interviews during trials:

(Trial 1 - 4/5/06 – 4/14/06): For more than three weeks, Dr. Dennis had an opportunity to trial three keyboards for the left-handed computer access and several writing and reading software programs. During the first trial, he was introduced to the Gesture keyboard, TextHelp: Read and Write and Writing with Symbols 2000 software programs. After the training on the device and programs, Dr. Dennis was asked to use them for nine days in order to determine if those technologies would meet his needs. At the end of the Trial 1, he demonstrated how he accessed the computer with the Gesture keyboard, typed using Text Help: Read and Write word prediction feature, and read online with the Text Help: Read and Write text-to-speech feature. The feedback from observations and interviews is summarized below.

Dr. Dennis did not like Writing with Symbols software and did not want to try it at all. He is very intelligent and wants to have creativity in the word choice and his writing. He refers to that program as "too babyish" and not challenging enough.

While Dr. Dennis liked the lightweight and portability of the Gesture keyboard, he really did not like the size and sensitivity of it. He said he was confused with the sensitivity on one hand and required amount of pressure on the other. In addition, the Gesture keyboard reaction time was always different and Dr. Dennis was also frustrated with the different degree of pressure he had to apply. However, this keyboard was very easy for him to set up.

Dr. Dennis also tried Text Help: Read and Write word prediction feature but it did not predict the words he wanted, making him and the assessor more frustrated than excited about spelling and typing. In addition, he did not like when the computer read out loud the definitions of all predicted words. It seemed like he could choose words including more difficult ones (e.g., homonyms, etc.) without any addition help. He also used Text Help: Read and Write text-to-speech feature to read different documents and Internet websites. He enjoyed that feature but noticed that it was not something of primary necessity for him since he could read quite some text before tiring.

(Trial 2 - 4/14/06 – 4/19/06):

During his second trial, Dr. Dennis was offered the Dvorak left-handed keyboard and Co:Writer word prediction program. He continued to use text-to-speech feature of the Text Help: Read and Write program.

It is important to note that the computer station was set up such that Dr. Dennis would need external help to plug in the Dvorak keyboard (as well as the BAT keyboard that he experimented with during the last trial period) into the PS/2 port on the back on the computer. Despite the difficulty of setting up the Dvorak keyboard (Mrs. Marcie helped with that), Dr. Dennis really enjoyed working with it and considered it to be his first choice. The key layout of the Dvorak keyboard was very convenient for him and increased his typing speed. He also liked the idea of having the regular keyboard with additional letters-stickers instead of obtaining a new device.

Co:Writer SOLO Edition program was the second word prediction software he tried. While it predicted many more words than Text Help: Read and Write there were still words that did not appear on the list even after numerous attempts. However, Dr. Dennis was excited about the topic dictionary feature especially when he learned that he could create his own topic dictionaries. It seemed like he was still a little bit overwhelmed with the options palette and sometimes was not sure where to find necessary options.

(Trial 3 - 4/20/06):

Upon Dr. Dennis and his wife's request, they visited the Assistive Technology lab at George Mason University to trial voice recognition software. They were very excited as Dragon Naturally Speaking software was demonstrated to them. Dr. Dennis expressed a willingness to attempt training the computer to his voice. He was offered a choice of reading the necessary sentences or repeating them after the trainer read them out loud for him. He chose to read sentences himself and was very successful with that. Unfortunately, the computer did not recognize Dr. Dennis's voice although he pronounced all the words very clear. It was obvious that due to his speech impairment – expressive aphasia, voice recognition is not an option at the time. Despite the

discouraging results, Dr. Dennis and his wife were very glad and appreciative of the opportunity to consider and trial a voice recognition program.

(Trial 4 - 4/19/06 – 4/28/06):

For the last trail period Dr. Dennis received the left-handed BAT keyboard and WordQ word prediction program. The BAT keyboard was quite challenging for Dr. Dennis but he really enjoyed that challenge. He was very excited about learning the key codes in order to type. However, due to the fact that he does not need to type long documents and is just interested in writing short passages and/or email messages, Dr. Dennis prefers Dvorak over the BAT keyboard, yet still is considering both of them.

He was introduced to the WordQ software program. It is a four buttons toolbar that works with any word processing and/or email application. Dr. Dennis liked the fact that this program does not have additional, unnecessary features. The day he first tried that program, Dr. Dennis was searching for the "Hidalgo" movie on the Internet. He tried to spell that word in WordQ and with just the basic dictionary, that word was predicted after the third letter typed. Needless to say, that program also predicted practically all other words Dr. Dennis was eager to use in his writing. In addition, he really liked the text-to-speech feature as well as the feature of reading out loud predicted words in a sentence for better understanding and easy selection.

While Dr. Dennis continued to use the text-to-speech features of the Text Help Read and Write program, it was discovered that Mrs. Marcie had purchased Universal Reader software several years prior to this assessment but due to the flaws in the program, it was never actually used. It was decided that Dr. Dennis needed simple document reader program (possibly Universal Reader upgrade) that would allow him to read documents and websites without any additional unnecessary features (e.g., dictionary, etc.).

Overall, Dr. Dennis seemed to enjoy exploring all the devices and software programs. He was excited about the word prediction feature so it is simply a matter of choosing the best program for him. At the beginning, it took him quite some time to get used to looking at the word list and listening to all the words read out loud to him. He kept saying that he did not know how to spell. Even at the end of the experimentation period, Dr. Dennis used read out loud features to hear the predicted words only in few cases. He was able to just look at the list and choose the word he wanted. He learned to refer to the list and select from it and became quite proficient. With the help of word prediction he was able to email the assessor, his parents and relatives and was very happy. Since the beginning of this project, Dr. and Mrs. Marcie acquired a second computer (laptop) so both of them can spend more time on the computer (please find Mrs. Marcie's letter attached).

Trial Results (4/28/06): The keyboards and software programs were collected at the end of the trial period. At that time, Dr. Dennis and his wife, Mrs. Marcie, were interviewed to gather information on their preferences. Below are abbreviated notes about each keyboard and software program. In addition, please find attached the keyboards evaluation summaries completed by Dr. Dennis and the letter with overall comments that Mrs. Marcie prepared for us.

Keyboards:	Dvorak	BAT	Gesture
Dr. Dennis's comments	- Keys layout is very comfortable; - Like the idea of using the regular keyboard - Typing speed increased and did not cause fatigue	- Enjoyed challenge of learning the codes - Liked the idea of steady hand placement (no going back and forth) - Expects to have increased typing speed as he learns the codes	- Liked the size and portability - Did not like sensitivity vs. pressure - Key size is too small for him

Software:	Read and Write	Co:Writer	WordQ	Writing with Symbols
Dr. Dennis's comments	- Did not predict the words he wanted - Was frustrated with the word prediction feature - Used text-to speech feature	- Most of the words were predicted - Liked the topic dictionaries - Excited about creating his own dictionaries	- All the words he wanted were predicted even not common ones - Liked the feature of words being read out loud in sentences - Excited and motivated to use this program	- Did not like writing by selecting pictures - Did not like the fixed phrases and lack of creative writing

* Dragon Naturally Speaking software program was trialed with Dr. Dennis but the computer did not recognize his voice due to his speech impairment – expressive aphasia, thus, it was not considered as an option.

Rationale and Suggestions

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The advancement of technology continues to support people with various disabilities and areas of need. Both software and hardware provide needed support in areas of reading, writing, and leisure. 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. As assistive technologies are provided, client's computer access and operation can potentially support his independence allowing for new and exciting activities.

The purpose of this report is to provide suggestions of assistive technologies that may be required to support Dr. Dennis's computer access as well as reading and writing/spelling activities based on his individual abilities and needs. After careful consideration, taking into account his preferences, the following devices and software programs are suggested. However, selection of a single device and/or a software program should be left for Dr. Dennis and his wife. It is suggested to make final decisions after an extensive trial period.

Suggestions are presented within each area of need in order of Dr. Dennis's preferences. Specific information regarding each technology can be found within each suggestion. It includes product description, price, and vendor information. In addition, 'pros' and 'cons' for Dr. Dennis actually using that particular product are listed.

Keyboard Suggestions

Dvorak Left-Handed Keyboard

The Dvorak left-handed keyboard layout is
specifically designed to increase the typing speed
and efficiency of people who type with one hand.
This alternative to a standard, commonly used
"QWERTY" layout is a part of the control panel
option on almost any computer. The left-handed
Dvorak layout places the most frequently used keys on the home row of the left hand, thus,
providing a "quicker and easier typing for a person typing with just one hand." This option is
perfect for Dr. Dennis. With it he does not need to acquire an additional device. He needs to just
adjust the layout of the keys using the keyboard he has by using keyboard covers and/or
keyboard stickers on the regular keyboard he is currently using. It is set up within the control
panel options:

- Under the **Start** menu select **Control Panel**
- Under **Control Panel** in the left pane, select **Switch to Classic View**
- Select **Regional and Language Options**
- In the **Regional and Language Options** dialog box, on the **Languages** tab select the
  Details button under **Text services and input languages**
- In the **Text Services and Input Languages** dialog box, under **Installed services**
  select the **Add** button
- In the **Add Input Language** dialog box, under **Keyboard layout/IME** select
  United States – Dvorak for left hand
- Select **OK** to close the dialog boxes
- To close **Control Panel** select the **Close** button

(From: http://www.microsoft.com/enable/products/windowsxp/default.aspx)

PROS	CONS
▪ Easy to set up	▪ Learn to type with new layout of keys
▪ Part of the Windows accessibility features; no additional software is required	
▪ Convenient keyboard layout that reduces fatigue and increases typing speed and accuracy	
▪ Cost	

Keyboard Covers
……………………………………………………………………………………………….$19.95

A Keyboard Cover can be a great solution that allows changing key positions in seconds without
permanently altering the original layout. It may require keyboard stickers (see below).

Keyboard Clear Stickers
……………………………………………………………………………………….$9.95

Clear stickers can be used on the regular keyboard or on the keyboard cover to create a special key arrangement according to the Microsoft Dvorak left-handed keyboard layout. Dvorak keys are printed on the right side of the clear stickers so that the original letters of the regular keyboard on the left show through the transparent material.

Large Format Computing, Inc.
131 Monticello Street,
San Francisco, CA 94132
(415) 722-0316
Fax: (415) 239-5783
http://www.language-keyboard.com/languages/dvorak.htm

BAT keyboard

BAT is a one-handed keyboard that replicates all the functions of the full-size keyboard with just seven buttons. As stated on the Infogrip Inc. website (http://www.infogrip.com/product_view.asp?RecordNumber=12), letters, numbers, and commands are represented by simple key combinations, "chords," that are easy to learn and use. BAT keyboard reduces hand strain and fatigue for greater efficiency and convenience. While it may take Dr. Dennis some time to learn the combinations, he expects to become better and faster with practice.

………………………………………………………………………….$229.00 (USB port)

………………………………………………………………………….$199.00 (PS/2 port)

PROS	CONS
• Can significantly increase typing speed	• Cost
• Significantly reduces mechanical movements across the keyboard	• The necessity to learn combinations
• Easy to set up; no additional software required	

Infogrip Inc.
1794 East Main Street
Ventura, CA 93001
800-397-0921
Fax: 805-652-0880
http://www.infogrip.com/default.asp

Half Keyboard

The compact Half Keyboard may be a great solution because it is a one-handed version of the standard keyboard. It has standard size keys and works just like the regular keyboard except that a person is required to hold down the space bar in order to type the letters of the opposite side of the keyboard. It is very easy to learn and the speed increases dramatically with practice. It is suggested for Dr. Dennis to try because it incorporates keyboard features that he liked during the trial like keyboard size and portability as well as it has standard keys that require regular pressure.

……………………………………………………………………………………………$99.95

PROS	CONS
▪ Easy to set up	▪ The necessity to learn and practice new keys arrangement for one side
▪ No additional software is required	▪ Cost
▪ Convenient size and portability	
▪ Increase in speed and decrease in unnecessary movements	
▪ Maintains half keyboard layout	

EnableMart Sales Office
4210 E. 4th Plain Blvd
Vancouver, WA 98661
888-640-1999
Fax: 360-695-4133
http://www.enablemart.com/default.aspx?store=10&dept=24

Free left-handed mouse

Dr. Dennis does not have any difficulty using right-handed mouse with his left hand but he could benefit from reversing actions controlled by the left and right buttons of a regular mouse. In order to reverse the button functions for the left-handed mouse use:

- Under the **Start** menu select **Control Panel**
- Under **Control Panel** in the left pane, select **Switch to Classic View**
- Select **Mouse**
- In the **Mouse Properties** dialog box, on the **Buttons** tab, under **Button configuration** select the **Switch primary and secondary buttons** check box
- Select **OK**

- To close **Control Panel** select the **Close** button

(From: http://www.microsoft.com/enable/products/windowsxp/default.aspx)

PROS	CONS
▪ Easy to set up	▪ None
▪ Part of the Windows accessibility features; no additional device or program is required	
▪ Will allow more convenient use of the regular mouse with the left hand	

Software Suggestions

WordQ

WordQ is a word prediction software program that suggests a list of words to use while writing and provides speech feedback. It is an easy-to-use toolbar that can be used with different computer applications including Microsoft Word, Internet, email, etc. It predicts words based on the context so that even before typing the first letter, a list of suggestions appears. It also predicts based on inventive spelling so Dr. Dennis does not have to know the exact beginning letters in the word. All predicted words are read out loud for easier selection. It also reads out loud everything written to ensure the accuracy of the overall written product. WordQ provides a choice of dictionaries but they are not theme specific. However, the advanced dictionary predicted most of the words that Dr. Dennis wanted to use in his writing regardless of their theme.

…………………………………………………………………………………………...$185.00

PROS	CONS
▪ Predicts the majority of intended words	▪ Cost
▪ Predicts based on inventive spelling and context	
▪ Works with any word processing program	
▪ Provides speech feedback	
▪ Easy to use toolbar	
▪ Dr. Dennis identified WordQ as his first choice program due to its extensive word prediction feature that perfectly fits his vocabulary and needs.	

Quillsoft Ltd.
2416 Queen Street East
Toronto, Ontario M1N 1A2, Canada
1-866-629-6737
Fax: (416) 698-1555
http://www.wordq.com

Co:Writer SOLO Edition

Co:Writer is a word prediction program that can be used with any word processor or any other text-based computer application. This program predicts based on spelling, grammar, frequency of use, and word relationships. Co:Writer interprets what the user is trying to say. A feature called FlexSpell allows a word to be spelled phonetically and then will predict the correct spelling. Letters are automatically capitalized at the beginning of sentences. The program predicts words with or without grammar cues. Co:Writer contains topic dictionaries built in the program as well as dictionaries that can be customized for Dr. Dennis's vocabulary. This feature allows the use of thematic prediction. Dr. Dennis really enjoyed using word prediction and topic dictionaries but did not use any other features.

……………………………………………………………………………………$325.00

PROS	CONS
▪ Learns individual user's writing patters	▪ Cost
▪ Uses inventive spelling and provides speech feedback	▪ To many unnecessary and sometimes confusing options
▪ Works with any word processing program	
▪ Topic dictionaries including creating your own	

Don Johnston Incorporated
26799 West Commerce Drive
Volo, IL, 60073
800-999-4680
Fax: 847-740-7326
http://donjohnston.com

Key to Access

Key to Access is an additional assistive technology device that may be considered for Dr. Dennis. It is a package of various software programs stored in the MP3 player. It is a convenient and portable solution for individuals with print-related disabilities. Key to Access includes text-to-speech programs for reading digital documents, websites as well as for scanning and reading hardcopy documents and books. It also includes word processing and prediction program, as well as other programs allowing different options, for example, listening to books away from the computer and/or a special tape recorder. This is a great tool allowing the user to access all different programs anywhere away from the base/home computer without downloading them.

……………………………………………………………………………………$349.95

PROS	CONS
• Includes several great programs in one package: text-to-speech, word prediction, books on tapes, etc.	• Cost
• No downloading needed, just plug Key to Access to the USB port and access any of the programs there	• May not be necessary if the user always works on one computer (e.g., at home)
• Portable and convenient tool	• Word prediction software is not WordQ
• Perfect for traveling and/or working on multiple computers in different locations (e.g., Stroke center, etc.)	

Premier Assistive Technology
1309 N William St.
Joliet, IL   60435
815-927-7390
Fax: 815-722-8802
 http://www.premier-programming.com/keytoAccess/Key.htm

Universal Reader Plus

Universal Reader is a text-to-speech program that works with any application including word documents, emails, Internet websites, etc. It is very easy to use, having highlighted text read out loud when pressing the Speech button. The adjustable option toolbar can be set up anywhere on the screen. The user has an option of having the read out loud text highlighted in a special window having the text read out loud without highlighting. It is possible to select voices and adjust reading speed. In addition, the new features of the Universal Reader Plus that are different from the previous version include the scanning capability so that now it is possible to have the hard copy document and/or book scanned and read out loud. This feature may be very useful.

Note: Dr. Dennis had some experience with Universal Reader but was not very successful. The reason for that might be the computer system and program incompatibility. The new version, Universal Reader Plus, requires Windows 2000 or XP so it should work better with his computer system.

…………………………………………………..(upgrade from Universal Reader) $39.95

PROS	CONS
• Works with all applications	• None
• Adjustable voices and speed	
• No additional tasks are required; just highlight text in any application and press Speech button	
• Great new feature of scanning hard copy documents and books	
• Cost; only upgrade from the program the client already has is required	

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Read Please 2003

Read Please 2003 is free text-to-speech software that has no expiration date. It will read out loud text from any application including word documents, Internet, emails, etc. However, it order for the text to be read out loud it is necessary to select that text, copy and paste it into the Read Please window.

PROS	CONS
• Cost; free of charge	• The requirement of copying and pasting text into a special Read Please window
• Adjustable voices and speed	

Read Please
http://www.readplease.com/

Other Technologies

Other assistive technologies that may be useful to Dr. Dennis for him to participate in his hobbies and recreational activities are listed below. These are not recommendations. They are simply considerations and require further exploration.

Leisure and Recreation				
AREA OF NEED	**TITLE**	**DESCRIPTION**	**VENDOR**	**PRICE**
Bridge	**Playing Cards Holders**	Various holders allow playing cards hands free. Life Solutions Plus offers a great variety of playing cards holders.	Life Solutions Plus http://www.lifesolutionsplus.com/recreation-c-39.html	$7.95 - $17.95
Sport / Outdoor activities	**Disabled Sports USA**	Disabled Sports USA is a national nonprofit organization that offers sport programs and activities for people with disabilities. Of a special interest to Dr. Dennis may be the list of equipment and resources for various sports as well as information on vendors and manufacturers.	Disabled Sports USA http://www.dsusa.org	
	Access to Recreation	Access to Recreation is another great resource that provides information on new, innovative equipment for various sports for people with disabilities.	Access to Recreation http://www.accesstr.com	
	Disability Links for People of All Abilities	This is a database website that offers information and links to a huge number of organizations and vendors organized by the category. Their Sports and Recreation section is quite impressive.	Allabilities.com http://www.allabilities.com/sports.html	

Aids for Daily Living	Resources and Catalogs	Dr. Dennis stated that he did not need any additional support for bathing and toileting at the time. The following resources are suggested for further exploration of aids for daily living in case of increasing need.	Sammon Preston Catalog http://www.sammonspreston.com Independent Living Aids http://www.independentliving.com Dynamic Living http://www.dynamic-living.com	Catalogs are free

PLEASE NOTE

Advances in technology are being made at a rapid rate. To assure that Dr. Dennis continues to access and use 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:
Anna Evmenova, PhD student in Assistive Technology

Kellar Institute for Human disAbilities
George Mason University

April 28, 2006

My husband, Dennis, has been working with George Mason University graduate student Anya Evmenova on an assistive technology project. Working with Anya has been a wonderful opportunity for Dennis to find new ways to reconnect with the world through increased use of the computer and the internet.

Dennis suffered a massive stroke on September 28, 2002. The stroke left him without the use of his right arm (he was right-handed) and with severe aphasia. The aphasia not only affects his ability to speak, it also affects his ability to read and write. His thought processes remain intact and he can readily process verbal information. Dennis is highly educated (PhD in Biochemistry) and had previously used the computer extensively for professional and personal pursuits. After his stroke, Dennis found using the computer very frustrating and used it mainly as a device for playing games.

Anya introduced Dennis to various keyboards to determine if a keyboard other than the commonly used keyboard would work better for him. Through the use of alternate keyboards he has been able to improve the speed with which he finds letters.

Anya also introduced Dennis to word prediction software. It has opened a whole new world to him. Using the software, he has started writing and sending email to family members who are thrilled to be able to communicate with him in this way. He also has started compiling lists of information, something he used to do extensively before his stroke.

Another tool Anya introduced to Dennis was reading software. Dennis can now go on the internet and, using the reading software, can read the content of web pages. He has been visiting many web sites and taking copious notes, another activity he enjoyed before his stroke.

I am personally thrilled at the results of Dennis and Anya's collaboration. The software and devices she introduced him to have greatly enhanced his ability to communicate and interact with the world. This is especially exciting because Dennis cannot drive and is homebound much of the time. He is excited and enthusiastic about his new found activities.

I hope that working with Dennis was also helpful to Anya in her academic pursuits. Anya is bright and enthusiastic in her approach to assistive technology. We are very grateful that the Fairfax County Department of Family Services provided a bridge between us and the George Mason assistive technology program.

Marcie C. Sponholtz