The Use of Assistive Technology in Rehabilitation and Beyond

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Objectives

- Overview of Assistive Technology (AT)
- Role of AT in Physical Medicine and Rehabilitation
- AT Evaluation Process
- AT in Action (Electronic Cognitive Devices, Adaptive Computer Access, Electronic Aids to Daily Living)
Era of Technology
Assistive Technology

“any item, piece of equipment, or system, whether acquired commercially, modified or customized, that is commonly used to increase, maintain, or improve functional capabilities of individuals with disabilities”

- The Assistive Technology Act of 2004
AT Evolution

- Vocational Rehab Act of 1918
- Smith-Fess Act – 1920
- Vocational Rehab Act Amendments (1943, 1954 and 1965)
- Rehabilitation Act of 1973
- Developmental Disabilities Assistance and Bill of Rights Act of 1975
- Rehabilitation Act Amendments of 1986
- Americans with Disabilities Act of 1990
- Rehabilitation Act Amendments of 1992 and 1998
ASSISTIVE TECHNOLOGY...

is a generic term that includes assistive, adaptive, and rehabilitative devices for people with disabilities and includes the process used in selecting, locating, and using them.

- **Communication Aids**
  - Speech and Augmentative Communication Aids
  - Writing and Typing Aids

- **Computer Access Aids**
  - Alternative Input Devices
  - Alternative Output Devices
  - Accessible Software
  - Universal Design

- **Daily Living Aids**
  - Clothing and Dressing Aids
  - Eating and Cooking Aids
  - Home Maintenance Aids
  - Toileting and Bathing Aids

- **Education and Learning Aids**
  - Cognitive Aids
  - Early Intervention Aids

- **Vision and Reading Aids**

- **Environmental Aids**
  - Environmental Controls and Switches
  - Home-Workplace Adaptations
  - Ergonomic Equipment

- **Hearing and Listening Aids**

- **Mobility and Transportation Aids**
  - Ambulation Aids
  - Scooters and Power Chairs
  - Wheelchairs
  - Vehicle Conversions

- **Prosthetics and Orthotics**

- **Seating and Positioning Aids**

- **Recreation and Leisure Aids**
  - Sports Aids
  - Toys and Games
  - Travel Aids
Rehabilitation’s Role in AT
Role of Rehabilitation and AT

- Physicians play a critical role as they will evaluate the patient’s current medical and mental status, identify precautions and areas to evaluate.

- Physicians need to be aware that AT is an option and referral sources.

- Rehabilitation Therapists bring diverse perspectives and specialty for evaluating a patient’s AT needs.

- Rehabilitation Team provides Education about AT.

- Examples of Interdisciplinary approach:
  - Adaptive Sports Clinic
  - Wheeled Mobility Clinic
  - Assistive Technology Clinic
AT Clinician's Role/Responsibilities

- Learn the devices &/or software
- Become knowledgeable about the Clinical Practice Guidelines - [www.prosthetics.va.gov/cprs](http://www.prosthetics.va.gov/cprs)
- Assess the patient’s needs, tasks and environment
- Collaborate with patient, family and the team to determine best fit for client
- Train the patient and caregiver/staff
- Outcome Measures of Satisfaction and Functional Usage
The Right AT Device?

- Team Decision
- Consult an Assistive Technology Professional
- Short term versus long term need
- Low Tech to High Tech
- Universal design - Less exclusive
- Societal attitudes, Social norms, practices and ideologies
- Intrinsic Motivated and Ability Limited
- Multi-Context – Beyond the 4 walls of Rehab
BENEFITS & CHALLENGES OF ASSISTIVE TECHNOLOGY
Benefits of AT

- Achieve maximum independence
- Increase sense of control
- Increase participation in life roles
- Increases efficiency
- Provides a level of privacy and dignity
- Decreases caregiver burnout
- Supports function in a variety of environments
- Portability and appealing
Challenges of AT

- Potential for an increase in frustration & anxiety
- Ineffective
- “One size does not fit all”
- Technology overload
- Training is more than 1 time
- Carryover may not occur
- Repairs
AT Evaluation Process

Pulling it all Together
HAAT model (AT Frame of Reference)

- A Model designed specifically for AT
- Consists of Four Components:
  - Human
  - Activity
  - Assistive Technology
  - Context

- Considering each element separately and interactively helps to select, design and implement appropriate AT that fits the individual and his/her lifestyle.
TEAM APPROACH

PATIENT
at Center of the Team

PCP/Specialty Providers

Audiology SLP

Family

PT/OT/KT/RT

Mental Health Psychology

Rehab Engineering

Vocational Rehab

Manufacturer Supplier(s)
General Overview of Evaluation for AT

- Patient assessment
- Identify patients’ and/or caregivers’ goals
- Identify roles and daily functions effected
- Assessment of patient motivation to use AT devices
- Determine current use and effectiveness of current AT and/or strategies
- Collaboration between patient and health professionals about the type of device that will best suit patient’s needs
- Training in the proper use of the device
AT Clinical Evaluation ... Sample Format of Documentation

- Patient Goals
- Patient Background
- Previous/Existing AT Devices
- Body Systems & Structures
- Activity

- Environment
- Trials/Simulation
- Outcome Measures
- Patient Education
- Impression/
  Recommendations
- Plan
Factors for Selection of AT Devices

• Patient and Caregiver Goals
• Least invasive device available
• Physical, mental, and cognitive strengths and challenges
• Environment(s) that the device will be used
• Patient’s current knowledge & usage of devices
• Pros versus Cons of the AT device
• Clinical Practice Recommendations
• Training time and Follow through
Hierarchy of Assistive Technology

- Modify the task
- Modify the environment
- Commercially available Products (off the shelf)
  - No Technology
  - Low Technology
  - High Technology
- Commercially Available Products specialized for the disabled
  - No Technology
  - Low Technology
  - High Technology
- Customized Assistive Technology
Key to Success..

- Collaboration with other services and/or disciplines
- Co-treat with treating clinicians in several sessions
- Training to all staff involved in patient’s care
- Comprehensive training and education to caregiver and/or family members of patient
ASSISTIVE TECHNOLOGY IN ACTION
Electronic Cognitive Devices

- ECD is a product or system that is used by an individual to compensate for cognitive impairments and support his or her ability to participate in ADLS or IADLS
Who Would Benefit from an ECD?

- Traumatic Brain Injury
- CVA
- Multiple Sclerosis
- Dementia
- PTSD
- Schizophrenia
- Autism
- Others…
Typical Cognitive Problems

- Attention
- Remembering to do things (medications, appointments)
- Memory for names/faces, locales
- Task Sequencing
- Multi-tasking

- Organization
- Time Management
- Dealing with Distractions
- Adapting to transitions and changes in routines
Other Symptoms to Consider

- Balance
- Visual impairment
- Speech impairment
- Auditory impairment
- Behavioral changes
- Initiating and perseverating
- [Safety] awareness
What can a ECD Help With?

- Scheduling/Reminders
- Time Management
- Task Sequencing
- Behavioral Cues
- Directions

- Assist with Transitions
- Participate in Daily Living Activities
- Participate in Vocational Tasks
- Participate in Community and Recreational Activities
- Participate in Educational Opportunities
What’s in Their Pocket??
EXAMPLES OF ELECTRONIC COGNITIVE DEVICES
Low-Tech Cognitive Aids
Recorders... Study Aides

Digital Recorder

Dragon Dictation App

Smart Pen
Plain Old Cell Phone

• Carry it everywhere
• Speed Dial for Frequent Calls
• Text-Messaging
• Contact information
• Camera
• Varied features by phone
Google Calendar > Cell phone

- Text message a calendar reminder
- Can be used on any cell phone that allows texting
Personal Digital Assistants
Smartphones

Palm Pre

Apple iPhone

Google Android Nexus One
Tablets

- Large icons for dexterity-challenged
- Louder speaker for augmentative communication
- Larger screen
- Low Vision
What about APPS???

**Things to Consider....**

- Apple versus Android
- Device Type
- Mounting
- Accessories
- Access

**APP Categories....**

- Time Management
- Money Management
- Medication Management
- Activity Analysis for basic and instrumental ADLS
- Education
- Health Management
- Behavioral Management
- Communication
- Visual & Hearing Impairment
Pillboxie

- 0.99
- IOS
- Visual
- Alarms
Memory App... iDress for Weather

- $1.99
- Any age
- Any ability anywhere in the world!
Memory App…
Keeper Password & Data Vault

• Free
• store and protect sensitive info such as credit card numbers, bank accounts, passwords, pin numbers, private notes, and any other secret information on your iPhone or iPAD Touch.
Astrid Tasks/To-do List

- **Free**
- **Set Tasks**
- **Alarms**
- **Offers Voice recognition**
- **Add to Calendars**
- **Android and IOS**
Super Note: Recorder, Notes, Memos

- $1.99
- Records information
- Take notes at the same time
- Organize/Categorize information
- Forward the information
Memory App...Evernote

- **Free**
- Turns the iPhone, iPod Touch and iPad into an extension of your brain, helping you remember anything and everything that happens in your life
- Instantly synchronizes from your iPhone to your Mac or Windows desktop
Informant HD Pro App

- $14.99
- Integrates calendars and to do tasks
- Timelines
- Prioritizing
- Organization
Case Study...ECD

- 45 year old male OIF/OEF Veteran
- Mild Traumatic brain injury while deployed in Iraq
- PTSD
- Impaired memory and organization
- Hearing Loss
- Visual Deficits

Goals:
- help with organization for daily activities
- remembering appointments
- stress management
- Get and keep a job
Case Study - ECD, cont.

- Device Features needed:
  - Portable
  - Light weight
  - Large screen
Case Study-ECD, cont.

**Trailed**
- Paper calendars/notes
- PDA
- Cellphone
- Smartphone
- iPad

**Results**
- iPad
- APPS:
  - Stress management
  - Hearing amplification,
  - Spiritual and emotional outlets based on patient’s interests (e.g. bible study)
  - Organization/time management

- Assisted with the following:
  - Organization
  - Independence
Research

- Mid to late 1990s
- Use of PDAs with various diagnosis
- Enable Job Support
- Enable Community Living
Adaptive Computer Access

- Specialized group of hardware and software designed to enable individuals with a wide range of disabilities to use a personal computer
Factors to consider

• Patient’s Goals

• Computers
  ◦ Skills
  ◦ Own a computer??
  ◦ Windows or Macintosh based system
  ◦ Desktop or Laptop

• Environment

• Patient’s diagnosis/prognosis

• Patient’s cognition

• Other AT Devices
Other Considerations

- Seating & Positioning
- Lighting
- WorkStation
- Access
Primary Areas to Address:

- Mouse Operations
  - Pointing
  - Clicking
  - Dragging

- Text Entry
  - Numbers
  - Letters
Mouse Operations

Pick a task...
- Adjust the contrast for text and colors on your screen
- Configure Windows to work for your vision, hearing, and mobility

or pick a Control Panel icon

Settings for MouseKeys

Keyboard shortcut
The shortcut for MouseKeys is: Press the left ALT + left SHIFT + NUM LOCK keys.
- Use shortcut

Pointer speed
- Top speed: Low, High
- Acceleration: Slow, Fast
- Hold down Ctrl to speed up and Shift to slow down

Use MouseKeys when NumLock is: On, Off
- Show MouseKey status on screen

OK Cancel
Commercially Available Products

Trackball

RollerMouse
Alternative Mouse Inputs

Footime Foot Mouse

Mouse Button-Box
QuadJoy

QuadJoy™ is a joystick operated two-button mouse and on screen keyboard (ships with OnScreen). The joystick is controlled with your mouth or chin. The farther you move the joystick, the faster the cursor moves. Mouse button activation can be made with the built in sip and puff switch, a switch with the external switch jack (sold separately) or manually with the actual mouse buttons for able body assistants. The button action is softer than sipping from a straw. QuadJoy can be mounted to most flat surfaces and is assembled to mount on the right hand side of the user.

QuadJoy $ 545.00
Platform: PC
Connection: Serial/PS2
External Switch Jack $ 35.00

Jouse
HeadMouse for Portables

Optimized for Laptop Computers

The HeadMouse for Portables is specially designed for use with laptop computers and augmentative communication devices. It adapts the proven technology from our flagship HeadMouse into a form factor that ensures security and convenience in applications with the palm displaying. HeadMice for Portables also offers special power supply features that can ensure integration in battery powered or externally powered environments.

A small Optical Sensor attaches directly to the computer display or augmentative communication system. A separate Interface Unit performs power conversion and signal processing, and can optionally supply additional power to a laptop computer. HeadMice for Portables retain all of the interface flexibility of our standard HeadMouse and can be powered either from AC wall outlets or directly from a battery. A battery pack and adapter cables for powered wheelchairs are offered as options.

Standard

Miniature

Excellent Companion for Augmentative Communication Devices

The HeadMouse for Portables provides easy access to augmentative communication devices for people with limited or no use of their hands. The HeadMouse integrates seamlessly with the augmentative communication systems from a variety of suppliers, including Freedom Scientific, Synthesis, and others, and is designed for easy integration with standard personal computer applications including Internet access.

Origin Instruments

Origin Instruments Corporation

1008 Corporate Dr., Superior, PA 15156
Tel: 800-888-8999 Fax: 800-888-8999
email: sales@ori.com web: www.ori.com
TEXT ENTRY

Pick a task...
- Adjust the contrast for text and colors on your screen
- Configure Windows to work for your vision, hearing, and mobility needs

or pick a Control Panel icon
Text Entry

- Reduced Size Keyboards
- Enlarged Keyboards

Low Profile Keyboard

IntelliKeys

Big Keys
Text Entry

- Keyboards for Low Vision
- Software for Low Visions

MaGiC
Voice Recognition Software

Dragon NaturallySpeaking 11 Premium with Bluetooth Headset

Dragon Dictate for Mac

On Screen Keyboards

REACH

Other Text Entry Alternatives
Other Text Entry Alternatives

- Kurzweil
- Wynn
- Read & Write Gold
- Word Q + Speak Q
- Inspiration
- Solo
- Ginger
Case Study...Computer Access

- 38 year old female veteran
- Army 8 years
- University of South Carolina as Administrative Assistant
- Divorced with 2 children
- 2006 Brainstem meningioma s/p surgical resection and radiation therapy with post radiation necrosis
- Shunt in 2006
- Right Hemiplegia
- Mild Visual Impairment
- Severe to Profound Dysarthria
Case Study - Computer Access

- Comprehension intact
- Memory intact
- Attention span good

Current AT Equipment
- Invacare 5000
- Dynawrite

Goals:
- “Email, shopping”
- “Get my masters”

Environment
- Parents Home
- Computer Locations
  - Bedroom
  - Living Room
Case Study - Computer Access

<table>
<thead>
<tr>
<th>Trailed</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mouse</strong></td>
<td><strong>Mouse</strong></td>
</tr>
<tr>
<td>- Trackball</td>
<td>- Joystick mouse with sticky keys</td>
</tr>
<tr>
<td>- Sticky keys</td>
<td>- Enlarge Cursor and Pointer</td>
</tr>
<tr>
<td>- Joystick mouse</td>
<td></td>
</tr>
<tr>
<td>- Enlarge Cursor and Pointer</td>
<td></td>
</tr>
<tr>
<td><strong>Text</strong></td>
<td><strong>Text</strong></td>
</tr>
<tr>
<td>- Mini keyboard</td>
<td>- BIG Keys Yellow keyboard</td>
</tr>
<tr>
<td>- BIG KEYS Yellow keyboard</td>
<td>- Word Q</td>
</tr>
<tr>
<td>- Word Q</td>
<td>- ZoomText</td>
</tr>
<tr>
<td>- ZoomText</td>
<td></td>
</tr>
</tbody>
</table>
Research

- Information about tools for computer access
- Pediatric and Stroke literature
- Spinal Cord and Vision literature
Overview of EADLs (ECUs)

- A.K.A. – Environmental Control Unit (ECU)
- EADLs provide a means for someone with limited functional mobility or dexterity to interact with their environment
- Most any device can be controlled
  - A Light or fan
  - Television, radio, and cable box
  - Air conditioner thermostat
  - Telephone
  - Hospital bed
  - Window blinds or drapes,
  - Door and camera
Overview of EADLs, cont.

User

Control interface / User display

Control Unit

- Light
- Fan
- Door opener
- Television
- Telephone
- Cable box
- Bed controller
The Patient – Most Important

Who Qualifies?

- Anyone who is unable to access items used in daily life
  - Television, cable box
  - Hospital bed, nurse call
  - Door, light switches
- Quality life and independence are important factors
- Example diagnoses: ALS, SCI, TBI, Locked in Syndrome
The Patient – Considerations

- Physical ability?
  - Determines access method
  - Evaluate with low technology
  - Consider progression
- Cognitive ability?
  - Determines ECU complexity
  - Static or dynamic
- Mental Status
  - Level of tolerance, patience, and/or PTSD
  - Help to determine device applicability
- Home environment?
  - Determines ECU type and applicability
  - House, apartment, or long term care facility
  - Single or multi-room
User Environment

- **Control area**
  - **Single room**
    - Typically the bedroom
    - Mounted to bed frame
    - Generally simpler installation
  - **Multi-room**
    - Mobile - control multiple rooms
    - Wireless base station or self contained
    - Typically wheelchair based
    - Mobile unit is battery powered – possibly by wheelchair

- **Mounting**
  - ECU, switch, and/or microphone
  - Wheelchair, bed, and/or floor stand
User Interfaces - Direct

- **Standard / adapted control**
  - Most efficient access method
  - Keyboard, mouse, touch screen, mouth stick, joystick, chin joystick, etc.

- **Voice control**
  - Totally hands free – typically more sensitive
  - Switch initiated – more forgiving
  - Various menu structures and complexities
  - Consider user vocal amplitude and phonation capability
  - Disposition is important (Background noise)
  - Backup indirect switch access is a good idea
User Interfaces - Indirect

- Scanning
  - Options are incremented through and selected when highlighted
  - Inefficient access method
  - Requires consistent and accurate switch activation
  - Single switch - selects and auto scanning
  - Double switch - one scans and one selects

- Directed scanning
  - More efficient, but more complex than normal scanning
  - Directional scanning control
  - Available option for some alternate communication devices

- Coded access
  - Very efficient, but not used often
  - Morse code
Transmission Methods - Remotes

- Infra-red (IR)
  - Television remote
  - Line of sight communication - bad
  - Portable
  - Learning remotes

- Radio Frequency
  - Simple remotes
  - Garage door openers
  - Not line of sight communication – good
Transmission Methods - Automation

- **Home Automation Systems**
  - Used to control lights, doors, thermostats, etc.

- **Power-line**
  - Uses existing AC house wiring
  - Inexpensive
  - Sensitive to power-line noise
  - House wiring affects operation
  - X10, Insteon

- **Home networks**
  - Wired local area network (LAN)
  - Wireless RF networks
    - Z-wave, Wifi, Bluetooth
  - Wi-Fi becoming more viable
ECU Devices

- **Direct input only**
  - X10 PalmPad
    - RF control of 16 devices
    - Only 8 channels at one time
  - X10 SlimFire remote
    - Radio Frequency (RF) control of 2 channels
    - Small keychain size
    - Dimmer control
  - X10 Mini timer
    - 8 channel on/off timer
  - Insteon RemoteLinc
    - 6 on / off buttons
    - Control 6 scenes (multiple devices per line)
ECU Devices, cont.

- Direct / indirect input
  - Relax II
    - Switch Input (1-2)
    - IR learning (4 devices, 10 commands each)
    - Preprogrammed RF X10 (10 devices)
    - Battery powered
    - Requires X-10 RF transceiver
  - Primo!
    - Touch screen and switch input (1-2)
    - Auditory and visual feedback
    - IR learning (many devices)
    - Preprogrammed IR X10 (8 devices)
    - Ready for Sero! phone control
    - Battery and AC powered
    - Requires X-10 IR commander

Ablenet

- $729
- $2,700
ECU Devices, cont.

- Voice activated
  - Pilot one
    - Ablenet, $2,100
    - Voice or switch input (1-2) with auditory and visual feedback
    - Must train to user voice and commands
    - IR learning (10 devices, many commands each)
    - Preprogrammed IR X10 (4 devices)
    - Ready for Sero! phone control
    - Battery and AC powered
    - Requires X-10 IR commander
  - Quartet Simplicity AIO
    - Quartet, $14,000
    - Voice or switch input (1-2) with auditory feedback
    - Must train to user voice and commands
    - IR learning (6 devices)
    - Preprogrammed X10 (64 devices)
    - Built in telephone
    - Battery and AC powered
Telephone access

- Ablephone 6000 (Vocally Infinity)
  - AblePhone or EnableMart, $219
  - Voice controlled telephone dialer
  - Combine with the Ameriphone RC200 for switch based or hands-free operation
  - Must train to user voice

- Ablephone 7000VC
  - AblePhone, $579
  - Total voice control solution
  - Auditory feedback
  - Must train to user voice

- Sero!
  - Ablenet, $1,195
  - IR controlled phone
  - Needs Primo!, Pilot, or other ECU for hands-free operation
  - Auditory and visual feedback
ECU Devices – Other Options

- Wheel chair interface
  - Quantum
    - Q-Logic enhanced display
    - Add on display for wheel chair controls
    - IR control (learning)
    - Bluetooth mouse
  - Permobil
    - R-Net Omni
    - IR learning
  - Invacare
    - Mouse emulator
    - No IR control
ECU Devices – Other Options, cont.

- Augmentative and Alternative Communication (AAC) Devices with IR control ability
ECU Devices - New Options

- Usage of mobile devices and computers to interface to home automation systems
  - Insteon Home Linc
  - X10 Activehome Pro

- Pros
  - Consumer products (cost efficient and appealing)
  - Can use conductive mouth stick for touch screen access on mobile devices
  - Computer – many adapted access methods

- Cons
  - Scanning input is not mature (yet)
    - iOS 6 Voiceover and Tecla Shield for scanning
    - Android 4.0 has Bluetooth mouse control
  - Voice activation not integrated into home automation apps / software (yet)
ECU Devices - New Options

- IR remote control adapters for computer and mobile devices
  - Computer – Wifi or USB connection
  - iOS and Android devices – Wifi, headphone, or dock connection
  - Requires software or App
  - Use for basic television control or home automation access
Smart Environments
ECU Devices - New Options

• Home automation interfaces
  • Software or web interface
  • Requires Wifi / ethernet connection, or USB adapter
• Mobile devices
  • iOS and Android based apps available
  • iPhone / iPod touch / Android OS cell phones
  • iPad / Android tablets – good for low vision
Case Study-EADLS - RUSS

- **History**
  - 37 year old male veteran
  - C4 AIS A C
  - Dysarthria, decreased inspiratory and expiratory strength/volume
  - Uses chin control on Permobil C500 wheelchair

- **Consult**
  - Independent computer access
  - ECU
  - AAC

- **Desire for access to lights, television, and front door.**

- **No desire to use ECU in bed**
Case Study-EADLS, cont.

- **Evaluation**
  - Computer access
    - Headmouse, QuadJoy, and Quadmouse
    - Bluetooth module on Permobil wheelchair and chin joystick
    - Dwell click, headrest mounted switch
  - AAC
    - AT consulted for access method (similar to computer access)
    - Dynavox Maestro and Tobii devices

- **Collaboration: OT, SLP, RE**
  - ECU
    - Goals of patient determined
    - Demonstration scanning access with Relax 2 and Primo!
    - AAC ECU functionality explained
Case Study-EADLS, cont.

- **Initial Results**
  - AAC, wheelchair, and ECU integration through Bluetooth mouse module and chin joystick
  - AAC / computer access
    - Dwell mouse click for computer (AAC) access
    - Independent AAC on/off control using IO module
    - AAC power supply adapter for wheelchair
  - ECU
    - Television control through AAC and wheelchair
    - X-10 light control using IR commander (line of sight)
    - X-10 operated door opener for front door
    - Sero! IR telephone for emergency calls
Case Study-EADLS, cont.

Follow-up Results:

- Post installation
  - Access to AAC and ECU while in bed
  - Door opener only works from inside the house
  - Sero! telephone incompatible with DSL land-line

- Second Prosthetics Service consult
  - Swap telephone with Broadened Horizons model
  - Add door opener control to IO module on wheelchair

- Re-trial Quadmouse, QuadJoy with floor stand
  AAC mounts
Research

- Minimal research in this area of EDALS specifically
  - outcome data is needed to support the use of ECU
  - Education to 3rd party payers
  - Training of rehabilitation therapists is critical
- Need for research in the use of these devices in the workplace
Veterans’ story

How has your assistive technology device affected your quality of life?
FUTURE OF ASSISTIVE TECHNOLOGY IN THE REHAB WORLD
TELEHEALTH, AT & PM&R

OPPORTUNITY KNOCKING
What is TeleHealth

• Providing health care services through the use of technology (i.e. video conferencing equipment)

Major Benefits

• allows patients to have improved access to healthcare services;

• is more convenient for patients and caregivers; and

• enables and improves primary and specialty care provider collaboration to optimize patient care outcomes.

TeleHealth
TeleHealth, AT & Rehabilitation

- Provide 1:1 consultation for any areas of AT
- Provide AT Evaluations
- Provide patient group education for any of the areas of AT
- Use of Technology for remote sites and home based primary care
AT & TeleHealth...Opportunity Knocking

- Follow up to the usage of AT after discharge
- Remote support on the Job Site, School, Community and/or Home
- Consultation with AT Rehab Engineering Team
- Provide staff in-services on any of areas of AT and/or specific device training
Brain Interface

Brain Control Devices
(BCD’s)

DTI
Diffusion Tensor Imaging

Gyroscope
Battery

SOURCE: Executiv

Brain imaging and control device diagrams.
Quantum to Nanocomputing

Every 18 months microprocessors double in speed
FASTER = SMALLER

Babbage's Engine
Silicon Wafers
Atoms

Classical Bit
0 or 1

Quantum Bit
0 or 1 or 01
“We have already succeeded in creating a biological automation made of DNA and proteins able to diagnose in a test tube the molecular symptoms of certain cancers and ‘treat’ the disease by releasing a therapeutic molecule”.

http://www.shandyking.com/2006/05/05/new-nano-computer-species/

They plan to spray the nanocomputers on to the chests of coronary patients, where the tiny cells would record a patient’s health and transmit information back to a hospital computer.

Robotics and Androids

- Personal Robotic
- Service Robotic
  - Healthcare
  - Canine service dog robotics for the blind
- Security & Defense
- Industrial Robotics
- Academic & Research
- Therapeutic Robots
  - VGo
Final Points...

- Communication
- Collaboration
- Education
- Team Building
- Share your expertise

- Provide support
- Education on types of AT devices
- Education on the usage of those devices
AT Resources

- AbleData
  - http://abledata.com/
- Alliance for Technology Access
  - http://ataccess.org/
- Assistive Technology Industry Association (ATIA)
  - http://atia.org/
- Closing the Gap
  - http://closingthegap.com/
- CSUN Technology and Persons with Disabilities Conference
  - http://csun.edu/cod/conf/
- DO-IT Technology and Universal Design
  - http://uw.edu/doit/resources/technology.html
- EmpTech
  - http://emptech.info/
- RESNA
  - http://resna.org/
- TraceCenter
  - http://trace.wisc.edu
- Association of AT Act Programs
  - http://ataporg.org
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References


References (cont.)


