The Role of Rehab Engineering and the Assistive Technology Center in Supporting Employment

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Objectives

- Explain the role of a rehabilitation engineer on a transition team
- Explain the role and importance of the assistive technology center in supporting employment
- Provide a list of assistive technology centers in Ohio to help transition teams access services when supporting employment
- Describe resources to meet the employment needs of those with intellectual and developmental disabilities
What is an Assistive Technology Center?

- **Assistive Technology:**
  - An umbrella term that includes assistive, adaptive, and rehabilitative devices for people with disabilities
  - Assistive technology promotes greater independence by enabling people to perform tasks that they were formerly unable to accomplish, or had great difficulty accomplishing, by providing enhancements to, or changing methods of interacting with, the technology needed to accomplish such tasks.

- **Center:**
  - Mathematics (location, center of an object in geometry)
  - Sports (positions such as basketball center)
  - Place (City Center, central business district)

http://en.wikipedia.org/wiki
The OSU Assistive Technology Center

- Central place where consumers can receive evaluations, recommendations, trialing of equipment, training, adjustments, fittings, and information.
- Access to trained clinicians specializing in this area of practice.
- Network of referrals and resources within the medical center.
The OSU Assistive Technology Center

Our service delivery model incorporates the current best-practices in terms of personnel, resources, and technology. Key to the success of the AT center is the multi-disciplinary team of rehabilitation professionals:

- Occupational Therapists
- Physical Therapists
- Rehabilitation Engineers
- Speech Language Pathologists
- Social Work
Assistive Technology

- Services, devices, strategies and practices that are conceived and applied to increase, maintain or improve functional capabilities of individuals with disabilities.

Cook and Polgar (2008)
Assistive Technology
Rehabilitation Technology

- Services, Devices, Strategies and Practices associated with the assessment, implementation, training, and follow-up process.
Rehabilitation Engineering

- Application of science and technology to improve the quality of life of individuals with disabilities.

Hobson and Trefler (2000)
Reswick (1983)
Why is Assistive Technology important in the workplace?

- What technology do I use on a typical day?
Assistive Technology: The Tools

- Technologies for Information, Communication, and Access
  - Computer Access
  - Information Technologies
  - Integrated Systems
  - Electronic Cognitive Devices
  - Sensory Aids

- Technologies for Manipulation
  - Upper extremity orthotics and prosthetics

- Technologies for Mobility and Locomotion
  - Lower Extremity Orthotics and Prosthetics
  - Wheelchairs
  - Spatial Orientation
  - Vehicle Modification

- Technologies for Environmental Access
  - Recreation and Play

Low Technology Aids

- General-Purpose Aids
  - Reacher's
  - Computers
  - Wheelchairs

- Special-Purpose Aids
  - Self-Care; Sock aide,
  - Work and School; typewriter splint
  - Play, Leisure and Recreation; hand cycle
Information, Communication, Access

- Technology solutions exist for
  - Storing and retrieving information
  - Communicating to co-workers
  - Communicating with e-mails
  - Communicating with customers
  - Communicating own needs

- Methods to access this information is endless
Standard options in Windows 7

- Make it easier to see, hear, and use your computer including ways to personalize your PC.
- Magnifier in Windows 7 includes a lens mode and full-screen mode.
- On-Screen Keyboard can be resized to make it easier to see and includes text prediction.
- Windows 7 also gives you more ways to interact with your PC by taking advantage of new strides in speech recognition and touch technology.

http://www.microsoft.com/enable/products/windows7/
AT center clinical Staff role

- Explore the use on Mac or PC accessibility features in a safe environment before they need to anticipate job functions.
- Identify best method to access computer
- Develop strategies to integrate into the work day.
Changes to the Standard Keyboard

- **Big Keys LX**
  - Standard sized keyboard with larger keys and bold labels
  - Designed by use with children and adults with manual dexterity disabilities or low vision.
  - No run on features
  - USB adapter
Ergonomic Keyboard

- Kinesis Contoured Keyboard
  - Key wells accommodate different finger length
  - Good for UE weakness
  - Backspace and enter moved to the thumbs
  - Contoured for palms
Mini Keyboards

- Magic Wand Keyboard
  - Designed for use by individuals with spinal cord injuries, MS, MD, Arthritis, neurological disabilities.
  - Does not require much strength
  - Use wand for contact
One Handed

- Maltron Right and Left handed keyboards
  - Designed for one handed operation
  - Shape accounts for finger lengths
  - Training is needed for familiarization
Control Interfaces for the User

- Automatic Speech Recognition as an Alternative keyboard
- Touch Screens and Touch Tablets
- Tongue Touch Keypad
- Access for users with Cognitive Limitations
- Eye-Controlled Systems
- Tracking of Body Features
- Brain-computer Interface
Mouse Control Interfaces for the User

- Standard and Alternative Electronic Pointing Interfaces
  - Mouse
  - Keypad Mouse
  - Trackball
  - Continuous Input Joysticks
  - Head-Controlled Mouse
  - Light Pointers and Light Sensors
Who would benefit from mouse alternatives?

- Neurological disabilities
  - TBI; CVA; SCI, CP
- Degenerative disorders
  - ALS; MS; MD; SMA
- UE disabilities
  - Arthritis; Nerve laceration; Carpal Tunnel
What types exist?

- Track balls
- Joysticks
- Mouse keys
- Touch pads
- Touch screens
- Switch Adapted
- Foot Controls
- Mouth operated
- Tracking Devices
- Eye Gaze
- Keyboarding options
Trackballs

- Trackballs generally require only gross hand movement to operate. Adapted trackballs typically have larger switches built in but are also compatible with external switches.

logitech  
Wow pen  
Kesington
Joysticks

- Joysticks typically have programmable buttons, a wide base of support and have a main multi-directional stick-grip. They are generally compatible with external switches.
Tools for Information and Communication

- Speech Pathologist; Vital component
- Ensures the following occurs:
  - Increases the independent functioning of individuals in real-life contexts
  - Customizable
  - Reduces care provider burden & stress
  - Reduces the “digital divide” for patients with cognitive impairment.
When considering ATC for a patient:

- **Feature Matching**: First obligation is to identify the patient's strengths and needs (current and future) and match those to the appropriate tools and strategies.

- This provides a framework for clinical decision making rather than choosing tools and strategies based on media, testimonials, etc.

- Should also be used when choosing available apps as well.
Examples of AT

Smartphone

- Mid-tech; Multi-Function; Commercial; requires telecommunications subscription
- Phone calls
- Address book
- Calendar functions
- Clock, alarm, reminders
- Instant messaging (text, multimedia)
- GPS
- Camera
- Other apps

Wexner Medical Center
- **Smart Pen**
  - Record everything you write and hear
    - [www.livescribe.com](http://www.livescribe.com)

- **Data Watches**
  - Mid-tech; Multi-Function; Commercial
  - Most effective when provide signal & content
  - Examples:
    - Timex™ data watch ($50-90)
    - Fossil Wrist Palm ($250)
    - Casio Databank watches ($20-60)
Technologies that Aide Manipulation and Control of the Environment
Accessibility have improved but we can personalize it

- Distance from parking to work area
- Work area set up and heights of items
- Assurance that equipment is compatible
- Location and planning for bathroom use
- Access to cafeteria and planning for carrying items
Technology for Mobility and Locomotion

- Manual and Power wheelchair use
- Topographical Orientation
- Strategies for accessing the building and grounds
Mobility Assistance

- Proper Assessment of equipment is important
  - Tolerate sitting throughout the day
  - Be able to adjust maneuverability
  - Access to work environment

- Equipment Modification
  - Programming of drive controls
  - Seating adjustment and/or additions
  - Cushions and back support changes
  - Wheelchair skills training
Where do we go?

- **Referrals** into AT centers to support employment transition
  - Assure clinician knowledge
  - Do they have an ATP on staff?
    - ATP: Assistive Technology Professional
    - SMS: Seating and Mobility Specialist
      - Advanced certification from Rehabilitation Engineering Society of North America
  - What is their service delivery?
    - Do they offer trial? Do they have follow up after equipment is delivered?
Who funds these services?

- **Medical Model**
  - Referral from MD opens clinician assessment
  - Bill for services based on LCD codes
  - Submit to insurance for approval

- **OOD referral, MRDD services, Waiver services**
  - Must have prior authorization before services

- **Private Payment model**
  - When above not available, services provided on discounted rate
  - Consumer agrees up on services and signs an agreement and services are provided
Medical Model

- Cleveland Clinic Children’s Hospital
  - General
  - Seating and Wheelchair Clinic
  - Technology Resource Center

- MetroHealth Hospital
  - Driver Rehabilitation
    - www.metrohealth.org/driver.rehab
  - Wheelchair Seating Clinic
    - Call (216) 778-5514; www.metrohealth.org/?id=304&sid=1
Medical Model

- The Ohio State University Wexner Medical Center
  - Assistive Technology
    - [www.medicalcenter.osu.edu/rehabilitation/services/Pages/Assistive-Technology-Center.aspx](http://www.medicalcenter.osu.edu/rehabilitation/services/Pages/Assistive-Technology-Center.aspx)
  - Rehabilitation Driving Program
    - [www.medicalcenter.osu.edu/rehabilitation/services/Pages/Rehabilitation-Driving-Program.aspx](http://www.medicalcenter.osu.edu/rehabilitation/services/Pages/Rehabilitation-Driving-Program.aspx)
  - Wheelchair Seating and Mobility Clinics
    - [www.medicalcenter.osu.edu/rehabilitation/services/Pages/Wheelchair-Seating-and-Mobility-Clinic.aspx](http://www.medicalcenter.osu.edu/rehabilitation/services/Pages/Wheelchair-Seating-and-Mobility-Clinic.aspx)

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Medical Model

- Cincinnati Childrens’ Hospital
  - Aaron W. Perlman Center
    - [www.cincinnatichildrens.org/perlman](http://www.cincinnatichildrens.org/perlman)

- University of Toledo Medical Center: Wheelchair Seating
  - [www.utmc.utoledo.edu/clinics/physicalmedicine_rehab/](http://www.utmc.utoledo.edu/clinics/physicalmedicine_rehab/)

- Flower Rehab Hospital: Wheelchair Seating Clinic
  - [www.promedica.org/flower](http://www.promedica.org/flower)
Medical Model

- Rehab Institute of Ohio-Miami Valley Hospital: Wheelchair and Adaptive Seating Clinic
  - [www.miamivalleyhospital.org/mvhdefault.aspx/id=64550](http://www.miamivalleyhospital.org/mvhdefault.aspx/id=64550)

- Akron-General Hospital: Wheelchair/Seating Evaluation; Driving Retraining
  - [www.akrongeneral.org](http://www.akrongeneral.org)
National Resource Centers

- Able Data (information about equipment/technology based on function, including employment)
  
  www.abledata.com

- CATEA Assistive Tech (database of AT products by function/activity)
  
  http://assistivetech.net

- Family Center on Technology and Disability (resource database)
  
  www.fctd.info/
National Resource Centers

- Infinitec (resource for AT in several settings, including the workplace)
  www.infinitec.org/work/index.html
- Job Accommodation Network
  http://askjan.org/soar/index.htm
- Wheelchair Net (resource for selecting/funding AT devices on function/activity)
  www.wheelchairnet.org
State Centers

- Assistive Technology of Ohio
  www.atohio.org
- Assistive Technology of Ohio Device Lending Library
  www.atohio.org/devices.html
- Assistive Technology Trading Post
  www.atohiotradingpost.org/home.php
- Autism Society of Ohio
  www.autismohio.org
State Centers

- Ohio Center for Autism and Low Incidence (OCALI): Assistive Technology Resource Guide

- Ohio’s Educational Service Centers (ESC) Association
  www.oseca.org/vnews/display.v/SEC/ESCs

- Ohio Legal Rights Service (help obtain access to assistive technology)
  www.olrs.ohio.gov

- Red Treehouse (resource center)
  www.redtreehouse.org
Thank you!!