

# Assistive Technology Interventions for the MS Patient

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# [ Objectives ]

- Describe a range of assistive devices to enhance function for patients with MS
- Explore funding options for AT
- Describe mobility platforms to match needs
- Describe the type of seating options for target group
- Define and demonstrate Integrated Controls
- Introduce EADLs
- Describe and demonstrate adaptive computing aids in areas of ergonomics, input assists, accessibility options, and rate enhancement

# [ What is Assistive Technology? ]

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## **Assistive Technology Devices**

Any item, piece of equipment or product system, whether acquired commercially off the shelf, modified, or customized that is used to increase, maintain, or improve the functional capabilities of children with disabilities.

(Section 300.5)

# [ Major Categories of AT ]

- Mobility, Seating and Positioning, & Adapted Transportation
- Aids for Daily Living
- Cognitive Assists
- Communication
- Sensory Aids
- Adaptive Computing

# Types of AT

# Symptoms of MS

- **Mobility, Seating and Positioning, Adapted Transportation**

Loss of balance, weakness in limbs, gait disturbances, fatigue

- **Aids for Daily Living**

Mobility, fatigue and vision issues

- **Cognitive Assists**

Cognitive difficulties, memory lapses

- **Communication**

Slurred speech, swallowing, aphasia

- **Sensory Aids**

Blurred and double vision, optic neuritis, nystagmus

- **Adaptive Computing**

Fatigue, cognitive difficulties, lack of coordination, numbness, spasticity, tremors, decreased memory, vision issues

# [Team Approach



# The Decision Making Team Members:

- User and Caregivers
- Occupational Therapist
- Physical Therapist
- Speech Language Therapist
- Assistive Technology Practitioner (ATP)/  
wheelchair supplier
- Biomedical Engineers
- Physician
- Adaptive Computing Specialist

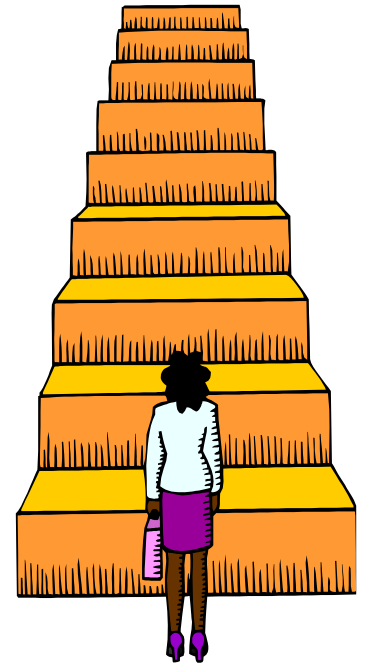
# [ AT Funding Issues ]

- Mobility Devices and Augmentative Communication Devices are typically covered (but there are many caveats)
- Bathroom equipment is rarely covered (never covered under Medicare)
- Computer adaptations, home modifications, vehicle modifications are not covered under insurance plans/Medicare
- Mississippi Medicaid does not cover items that are beyond “standard” for individuals over the age of 21 (i.e. this includes lightweight manual wheelchairs, scooters, power wheelchairs, seating/positioning products, and pressure redistribution cushions)

MISSION IMPOSSIBLE????? 

# [ AT Funding Issues ]

- There is an increase of insurance companies following Medicare guidelines with regards to funding DME.
- Medicare currently has an in the home (ITH) rule which means that the recommended item must be primarily used inside of the home setting.



# [ Physician Visit Requirements ]

- A patient must be seen for a face to face visit with their physician prior to beginning the process. Documentation regarding the need for a mobility device is required.
- Seven element order must be signed.
- Often a physician will refer a patient to a therapist to complete the face to face visit and to make recommendations for what is appropriate.

# [ Funding Caveats ]

- Mobility devices are expected to last a minimum of five years. Consider this....Can it be upgraded???
- A thorough evaluation is critical to ensure that the patient will qualify for the item recommended. MRADL's (mobility related activities of daily living) must be addressed.

# [ Always Plan for the Future ]

- If a person has Medicare then they will not qualify under their benefits for a manual wheelchair once the benefits are used for a power mobility device. (ie power into manual tilt in space).

# [ Additional funding options ]

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- Make referrals to Mississippi Department of Rehabilitation Services (MDRS)
  - Independent Living Division
  - Vocational Rehab Division
- LIFE of MS
- Mississippi Paralysis Association (MPA)


# [ Complex Rehab Technology ]

- Call your Congressmen to support a Separate Benefit Category for CRT



[ Looks Can be Deceiving ]

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- A large black left bracket is on the left side of the slide, and a large yellow right bracket is on the right side. A horizontal line with a yellow-to-white gradient runs across the slide, positioned between the brackets.
- MS has many different characteristics.
  - A person can initially appear to have less involvement than what is real.
  - Balance/coordination/endurance can negatively impact a persons ability to be a functional manual wheelchair user.

# [Mobility Goals]

- Increase independence in the home and community
- Compensate for decreases in function through adapted and / or electronic equipment

# [ Ambulation Assistive Devices ]



# [ Seating and Wheeled Mobility ]

- Consideration should be made regarding the following:
  - Balance/coordination
  - Vision
  - Cognition (problem solving, judgment, attention span)
  - Motor planning (ataxia/apraxia)
  - Strength
  - Endurance
  - Spasticity

# [ Manual Wheelchairs ]



# [ Scooter/ Power Operated Vehicle (POV) ]



# [ Power Wheelchair -Basic ]




# [ Manual Tilt in Space ]



# Positioning goals

- Improve/accommodate posture
- Reduce affects of abnormal tone/reflexes
- Provide increased comfort
- Provide decreased risk for skin breakdown

# Pressure Ulcers

- The average cost to treat a person with a pressure ulcer was \$37,000 in 2003.
- The average cost of adding a power tilt system to a wheelchair is \$6000
- The average cost of a pressure redistribution cushion is \$400 

# [ Power Tilt in Space ]



# [ Power tilt in space ]

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- Provides pressure relief
- Decreases pain/increases sitting tolerance
- Allows for ease of repositioning
- Improves trunk or head control
- Assists with better swallow mechanism

# [ Power Recline ]



# [ Power recline ]

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- Pressure relief
- Decreases transfers
- Provides passive ROM
- Allows supine position for resting
- Bladder management (ostomy/colostomy care)
- Relieves pain/increases sitting tolerance

# [ Power Elevating Legrests ]



# [ Power Elevating Legrests ]

- Edema management
- Positioning in conjunction with Power Recline (reduces shear)
- Passive ROM of lower extremities



- Power  
Seat Elevator



# [ Power Seat Elevator ]

- Allows for higher reach than typical seated height provides (ex. Reaching for cups or medication in higher cabinets)
- Increases function in the home (Ex. improves visual input from things like pots/pans on a stove, reaching into a washing machine)
- Improves transfers by allowing user to raise chair to come to stand or to scoot from the wheelchair onto another surface
- Helpful in a work setting
- Increases better eye level communication/ improves social interaction with others

# Combined Seat Functions



# Other goals

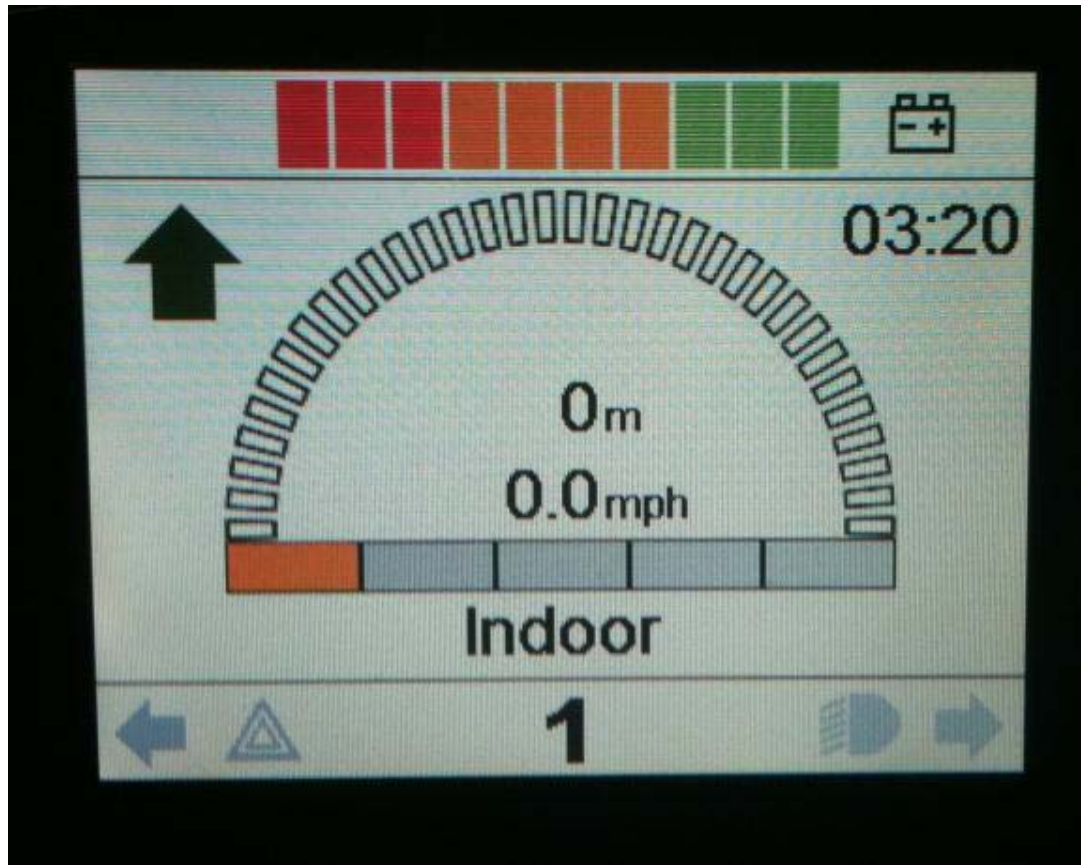
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- Meet caregiver goals (be specific)

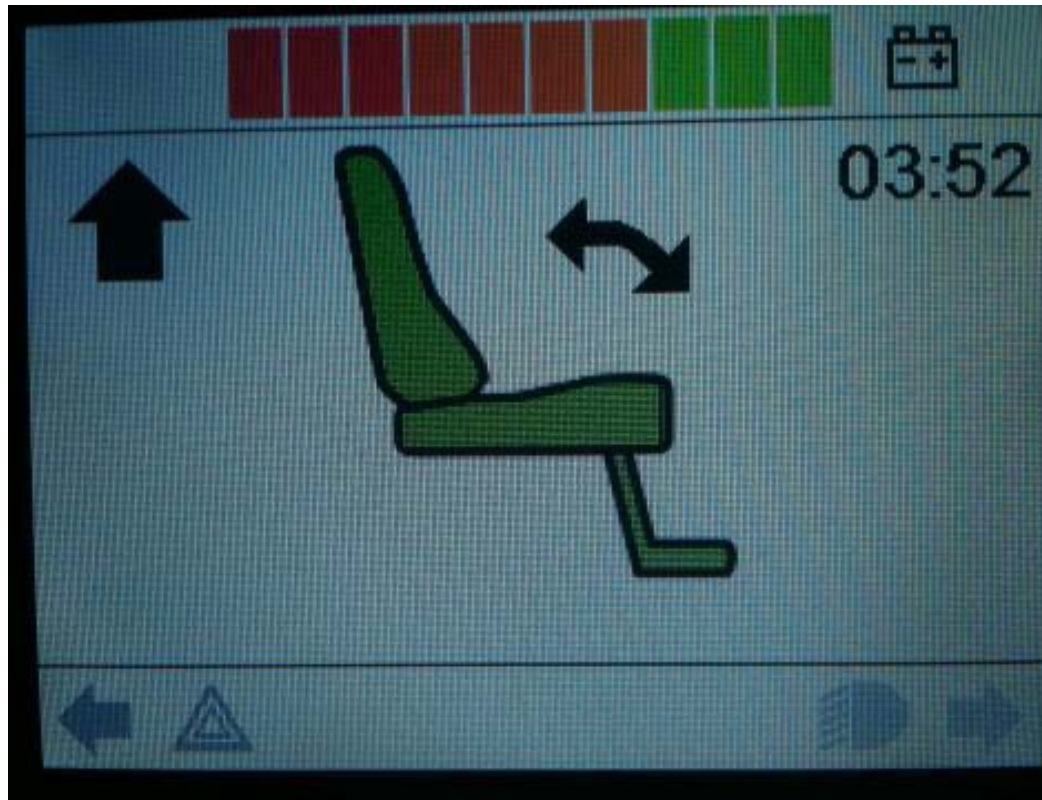
# Demonstration of Integrated Controls

- Programming explanation
- Wheelchair drive programs
- Seating
- InfraRed external device control
- Bluetooth computer control

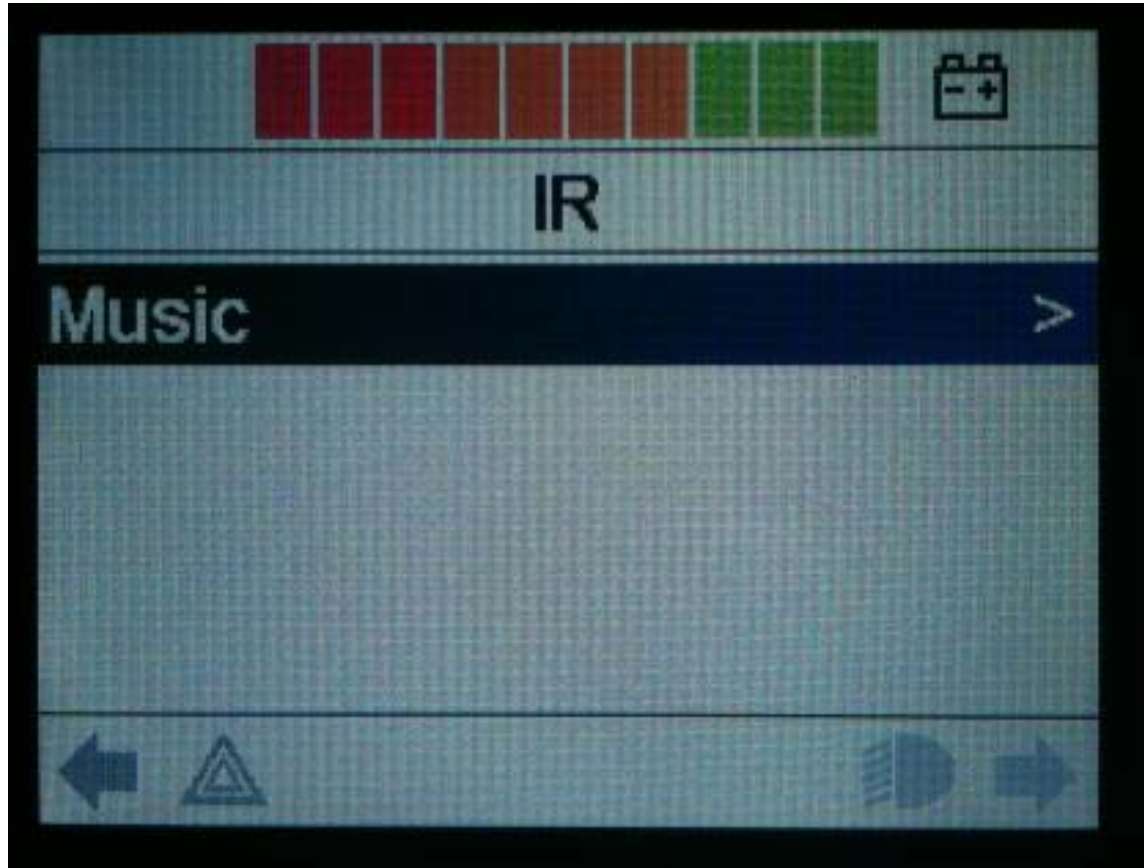
# Heads Up Display Drive Menu Screen



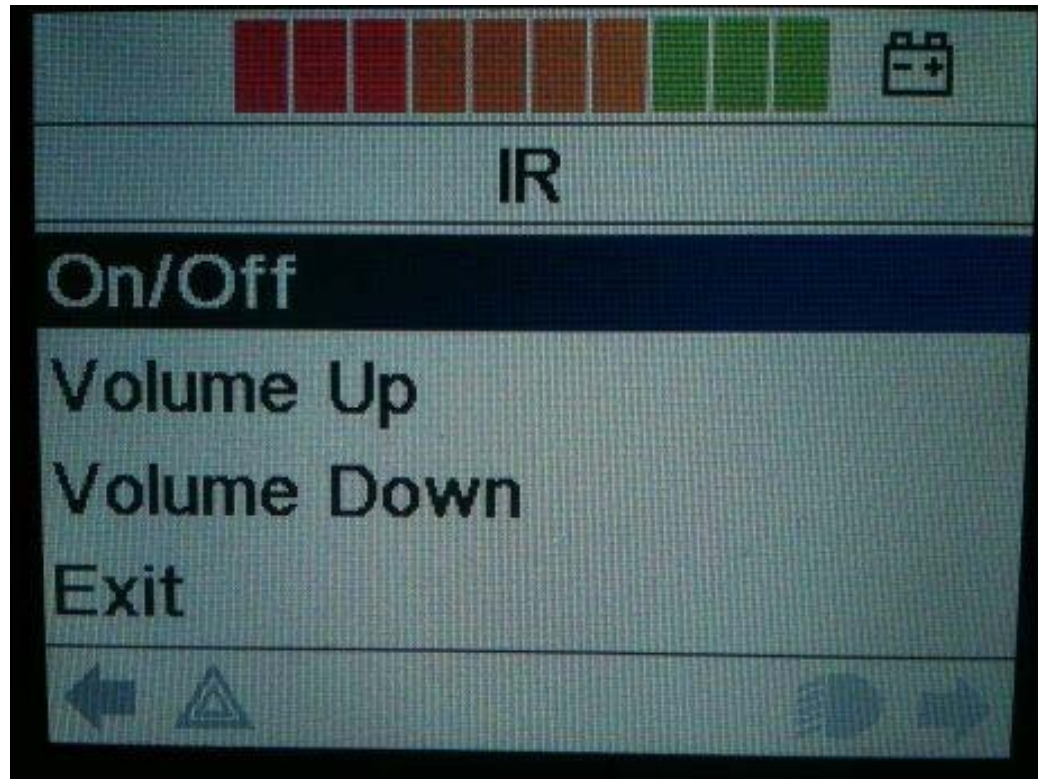
# Heads Up Display Seating Menu Screen



# Heads Up Display Infrared Menu Screen



# Heads Up Display Infrared Music Sub Menu Screen



# Electronic Aids for Daily Living EADLs

## Level 1:

High tech...allowing nearly full control of the home via an Environment Control Unit (ECU)



# Electronic Aids for Daily Living EADLs

## Level 2:

Less comprehensive remote access to  
Infrared devices



# Electronic Aids for Daily Living EADLs

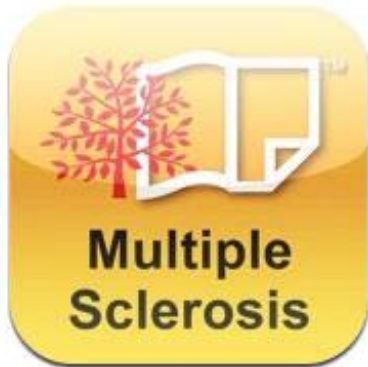
Level 3:

Smart devices with a specific purpose



# Mobile Devices iDevices...iPhone, iPad

Apps for persons with MS...



**Multiple  
Sclerosis  
eBook**



**MSAA  
self-care  
manager**

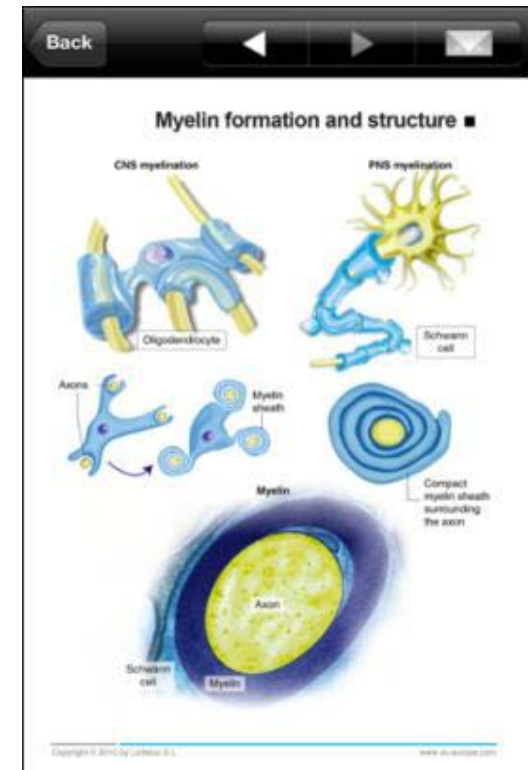
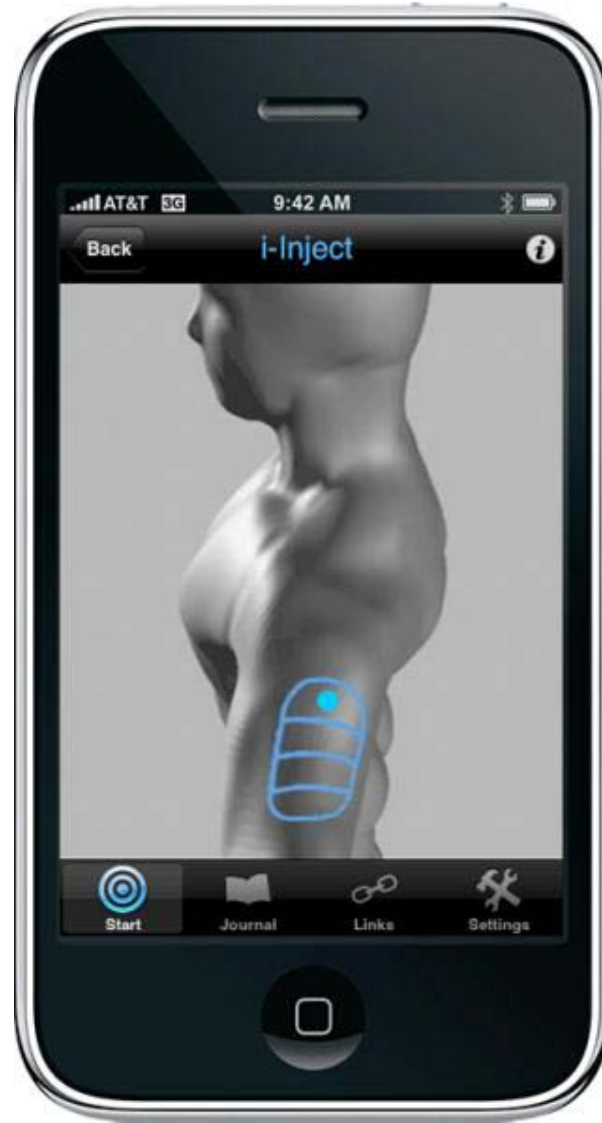


**MiniAtlas  
of MS**



**i-Inject  
Injection Site  
Management**

# [ App Examples ]

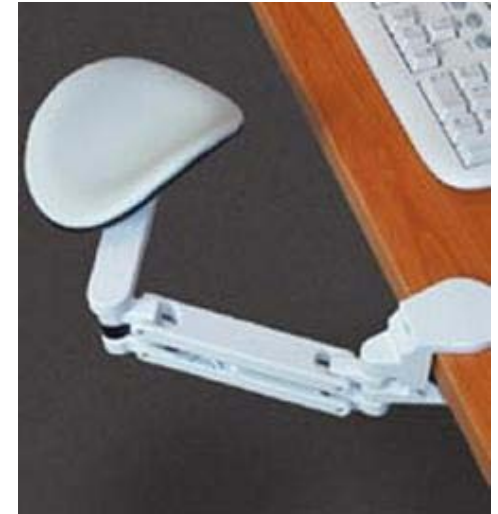


# [ Adaptive Computing Elements ]

- Ergonomics
- Adaptive Input and Adaptive Output
- Accessibility Features
- Rate Enhancement

# [ Ergonomics ]

- Mice
- Keyboards
- Display Height
- Workstation
- Wrist Support



# Adaptive Input: Keyboards

- Enhanced Vision
- Alternate Style
- Reduced Size
- Increased Size
- One Handed
- Programmable



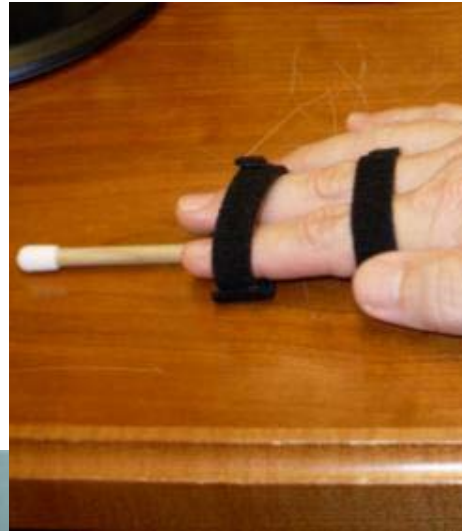
# Adaptive Input: Mice

- Ergonomic
- Trackballs
- Joysticks
- Switched
- Mini-Mice
- Centrally located



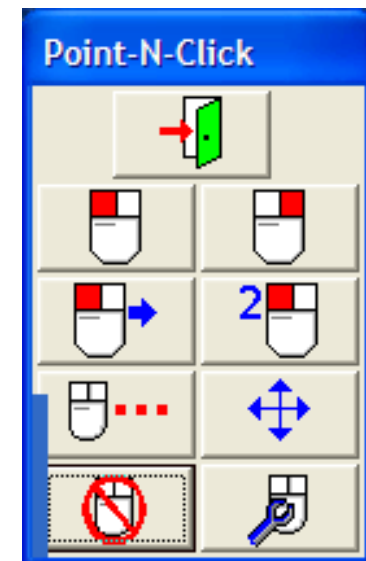
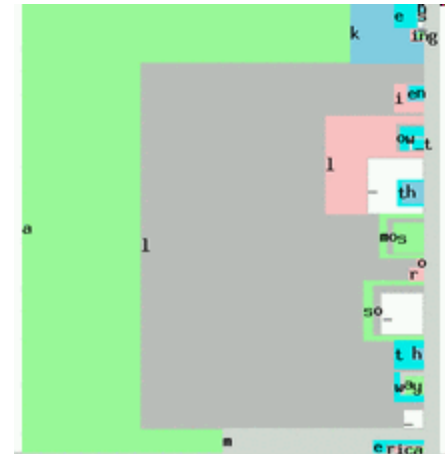
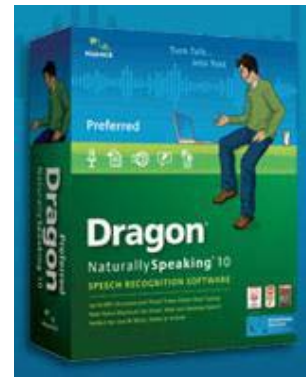
# Adaptive Input: Physical Devices

- Orthotic typing aids
- Hand Sticks
- Custom Devices



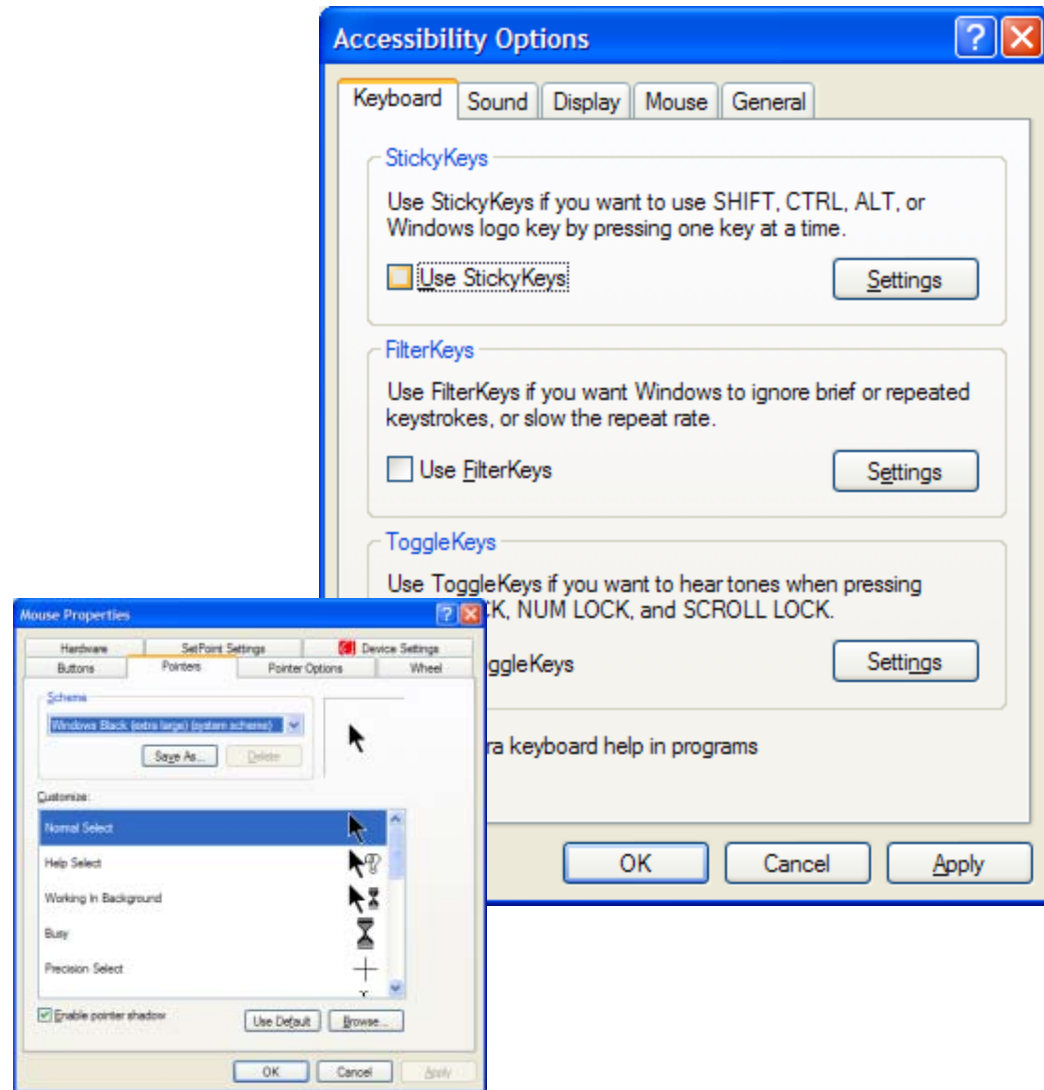
# Adaptive Input: Software

- On Screen Keyboards
- Mouse Emulators
- Word Prediction
- Voice Recognition



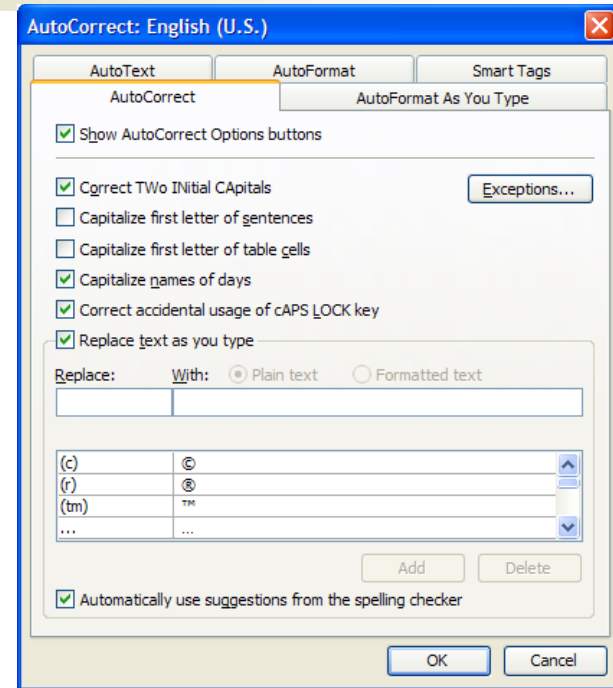
# Accessibility Features

- Sticky Keys
- Filter Keys
- SnapTo
- High Contrast
- Enlarged Cursors



# Rate Enhancement: Shortcuts

- Keyboard Shortcuts
- Programmable Keys
- Abbreviation Expansions



# [ Resources:

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- Handout
- Assistive Technology Clinic
- Adaptive Computing Lab
- PowerPoint on the Internet