

ACCESS: PREPARING FOR THE ATP EXAM

Michelle L. Lange, OTR/L, ABDA, ATP/SMS

2

Learning Objectives

After this course, participants will be able to:

- List three access methods used to control assistive technology devices.
- Identify clinical indicators for three different access methods.
- Recognize facilitators for three different access methods.

3

What we will be covering:

- Access
 - Definition
 - Access Methods
 - By AT Device
 - Clinical indicators



4

The ATP Certification

- The Assistive Technology Professional (ATP) certification is offered through the Rehabilitation Engineering and Assistive Technology Society of North America (RESNA)
- This demonstrates a basic level of competence in the practice area of Assistive Technology
 - Over 4000 people hold the ATP certification
- This series of courses will include information to prepare the candidate for this examination



5

The ATP Certification

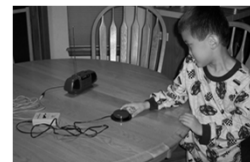
- The candidate must fulfill specific pre-requisites before taking the examination
- For Occupational Therapy Practitioners with a Bachelor's or Master's degree, 1000 hours of work experience is required over 6 years.
- For further information:
 - <http://www.resna.org/get-certified/exam-eligibility-requirements>



6

Access Methods

- What is Access?
- Per the HAAT Model, Access is:
 - Human Technology Interface
 - Input device or control interface
 - Provides **input** to the AT device
 - Provides **control** of the AT device



7

Access Methods

- Direct
- Mouse
- Joystick
- Eye Gaze
- Voice
- Switch



8

Access Methods by AT Device

- Power wheelchairs
- Speech generating devices
- Computers
- Tablets
- Electronic Aids to Daily Living



9

Access Methods by AT Device

- Power Wheelchairs:
 - Joysticks (proportional control)
 - Alternative proportional controls
 - Switches (digital control)



10

Access Methods by AT Device

- Augmentative Communication:
 - Direct
 - Mouse
 - Eye Gaze
 - Switch



11

Access Methods by AT Device

- Computers:
 - Direct
 - Mouse
 - Eye Gaze
 - Voice
 - Switch



12

Access Methods by AT Device

- Tablets:
 - Direct
 - Mouse
 - Switch



13

Access Methods by AT Device

- Electronic Aids to Daily Living (EADLs):
 - Direct
 - Voice
 - Switch
 - Through other AT Devices



14

Access Methods

- Categories
- Clinical Indicators
- Facilitators
- Programming

15

Direct Access

- Definition
- Clinical Indicators
- Facilitators
- Programming



16

Direct Access

- Definition:
 - Direct access by finger or pointer to location on AT display or keyboard



17

Direct Access

- Eye Gaze and Voice Access are also considered Direct Access methods
 - As items are directly chosen, rather than having to scan or otherwise move to a selection
 - We will discuss these access methods later

18

Direct Access

- Clinical Indicators
 - Requires accuracy, finger isolation
 - For the required amount of items on the display
 - Requires sufficient activation pressure
 - Requires ability to release (stability)
 - Vision and literacy



19

Direct Access

- Facilitators
 - Positioning
 - Optimal positioning provides stability for function
 - Splinting
 - Pointers
 - Keyguards

20

Direct Access

- Facilitators
 - Splinting
 - Wrist alignment
 - Finger isolation



21

Direct Access

- Pointers
 - Hand held
 - Splint or universal cuff mounted
 - Head mounted
 - Chin mounted
 - Mouth stick



22

Direct Access

- Keyguards
 - Provide stability
 - Promotes finger or thumb isolation
 - Visual implications



23

Direct Access

- Programming
 - SGD specifics:
 - Activation on contact or release
 - Activation Acceptance time
 - Allows client to move across display without accidental activations
 - Audio feedback
 - Computer/Tablet specifics:
 - Operating system accessibility settings



24

Direct Access

- Keyboards
 - Keyboard layout
 - One-handed strategies
 - Enlarged keyboards
 - Rate enhancements strategies
 - Word prediction
 - Word completion
 - Abbreviation Expansion



25

Mouse Access

- Definition
- Clinical Indicators
- Facilitators
- Programming

26

Mouse Access

- Definition:
 - Hybrid access method in which movement of the mouse is translated into movement of a highlight or cursor over specific options on display
 - 360 degree movement and proportional speed on computers
 - SGDs: typically vertical, horizontal and diagonal movement is recognized
 - If SGD is a computer, mouse acts like a computer mouse



27

Mouse Access

- Mouse Types:
 - Standard mice
 - Joystick mice
 - Adaptive mice
 - Trackballs
 - Head mice

28

Mouse Access

- Mouse Types:
 - Standard mice
 - Most clients having the dexterity to use a standard computer mouse can directly access many AT devices



29

Mouse Access

- Mouse Types:
 - Joystick mice
 - Provides stability of a joystick and the maneuverability of a mouse



30

Mouse Access

- Mouse Types: Adaptive mice
 - Trackballs
 - Accommodates larger, less controlled movement patterns
 - Speed may be adjusted on the mouse



31

Mouse Access

- Mouse Types: Adaptive mice
 - Touchpads
 - Accommodates limited range of motion and strength
 - Requires good fine motor control
 - Tapping may select



32

Mouse Access

- Mouse Types:
 - Head mice
 - Typically a light reflective dot is placed on the forehead or close by
 - Camera mounted to SGD translates head movement into movement of the cursor
 - These clients may also be able to use eye gaze



33

Mouse Access

- Facilitators
 - General Positioning
 - If hand is used, provide adequate upper extremity support
 - Splinting for alignment and stability, if needed
 - If hand is used, provide mounting of mouse, if needed, in optimal location



34

Mouse Access

- Programming
 - Selection Method
 - If client cannot press a mouse button or one is not present
 - Dwell or Pause
 - Switch Activation



35

Mouse Access

- Programming
 - Speed
 - Typically programmed on AT device
 - Keep the cursor on the display!
 - May be helpful to program "resting" areas for the cursor on SGD layouts



36

Joystick Access

- Definition
- Clinical Indicators
- Facilitators
- Programming

37

Joystick Access

- Joysticks are primarily used with power wheelchairs and are not an access option on other AT Devices
- Joysticks translate movement of the joystick into movement of the power wheelchair
- Many kinds
 - Size, handle, force required, travel required



38

Joystick Access

- Joysticks and a few others
- Requires grading of force and distance of movement
- Proportional Control
 - 360 degree control
 - Speed control



39

Joystick Access

- Facilitators
 - Positioning of joystick and client
 - Support forearm and hand



40

Joystick Access

- PWC Programming
 - Driving parameters
 - Proportional specific parameters



41

Eye Gaze Access

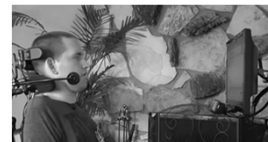
- Definition
- Clinical Indicators
- Facilitators
- Programming



42

Eye Gaze Access

- Definition:
 - Eye movement is translated into cursor movement



43

Eye Gaze Access

- Clinical Indicators
 - Good eye gaze control
 - Adequate vision to distinguish desired selection
 - Good head control
 - Newer technologies can accommodate this much better than before



44

Eye Gaze Access

- Facilitators
 - Positioning for optimal head control and stability
 - Head support that provides optimal support and stability



45

Eye Gaze Access

- Programming
 - Selection Method
 - When used as a mouse, a means of making a selection is required
 - Dwell or Pause
 - Switch Activation
 - Head mounted option
 - Speed
 - Dependent on speed of eye movements



46

Voice Access

- Definition
- Clinical Indicators
- Facilitators
- Programming

47

Voice Access

- Available access method for computers and EADLs primarily
- Voice commands provide direct input, such as dictation, or execute commands
- Computer:
 - Voice can be used to emulate keyboard and mouse



48

Voice Access

- Clinical Indicators:
 - Clear and consistent voice
 - Important to use voice correctly to minimize RSI risk
 - Back-up method may be required



49

Voice Access

- Facilitators:
 - Positioning
 - EADLs may be used from wheelchair or bed
 - External, high quality microphone
 - Training

50

Voice Access

- Programming
 - Programming shortcuts
 - Training to improve recognition level



51

Switch Access

- Definition
- Clinical Indicators
- Facilitators
- Programming

52

Switch Access

- Definition:
 - Indirect access method
 - 1 – 5 switches are used, dependent on AT Device controlled
 - SGDs, Computers/Tablets and EADLs – scanning
 - PWCs – each switch represents a directional movement



53

Switch Access

- Clinical Indicators
 - When client cannot use the other access methods
 - Least efficient method...most of the time
 - Any switch type or location



54

Switch Access

- An ideal switch site uses:
 - small movement
 - isolated movement
 - volitional movement
 - controlled activation
 - sustained pressure
 - controlled release



55

Switch Access

- Facilitators
 - Positioning of the client
 - Positioning of the switch
 - Stability for isolated control



56

Switch Access

- Programming - SGD
 - Scanning Method
 - Single switch
 - One switch starts scan, makes selection
 - Dual switch
 - One switch moves highlight
 - Second switch selects



57

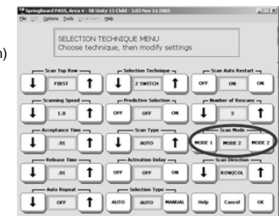
Switch Access

- Programming - SGD
 - Scanning Pattern
 - Auto scan, single switch
 - Linear
 - Row Column
 - Column Row
 - Quadrant

58

Switch Access

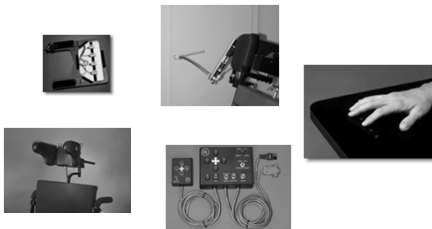
- Programming - SGD
 - Scanning speed
 - For auto scan
 - Select on activation
 - Hold time
 - Select on release (sometimes called Inverse scan)
 - Hold time
 - Scanning strategies
 - prediction



59

Switch Access

- Power Wheelchairs
- Basically, using 1-5 switches to control the direction of the chair



60

Conclusion

- Selecting the most appropriate access method is critical to meeting an individual's motor, sensory and cognitive abilities
- The access method provides independent control of the AT device
- Facilitators and programming optimize access to an AT device

61

References

- Kenney, M. J., Jain, N. R., Meeks, L. M., Laird-Metke, E., Hori, J., & McGough, J. D. (2015). Learning in the Digital Age: Assistive Technology and Electronic Access. *The Guide to Assisting Students With Disabilities: Equal Access in Health Science and Professional Education*, 119.
- Mumford, L., Lam, R., Wright, V., & Chau, T. (2014). An access technology delivery protocol for children with severe and multiple disabilities: A case demonstration. *Developmental neurorehabilitation*, 17(4), 232-242.
- Folan, A., Barclay, L., Cooper, C., & Robinson, M. (2015). Exploring the experience of clients with tetraplegia utilizing assistive technology for computer access. *Disability and Rehabilitation: Assistive Technology*, 10(1), 48-52.
- Pasqualotto, E., Matuz, T., Federici, S., Ruf, C. A., Bartl, M., Belardinelli, M. O., ... & Halder, S. (2015). Usability and Workload of Access Technology for People With Severe Motor Impairment A Comparison of Brain-Computer Interfacing and Eye Tracking. *Neurorehabilitation and neural repair*, 1545968315575611.
- Carver, J., Ganus, A., Ivey, J. M., Plummer, T., & Eubank, A. (2015). The impact of mobility assistive technology devices on participation for individuals with disabilities. *Disability and Rehabilitation: Assistive Technology*, 1-10.

62

Resources

- Lange, M. Access. In *Fundamentals of Assistive Technology*, 4th Ed., RESNA Press, 2008.

63

Thank you!

64

Contact Information:

- Michelle Lange
- MichelleLange@msn.com
- www.atilange.com