Speech Generating Devices: Determining access

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SPEECH GENERATING DEVICES: DETERMINING ACCESS

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

- Who I am

What we will be covering:

- Access Methods for Speech Generating Devices

Learning Objectives

- After this course, participants will be able to:
  1. Describe clinical criteria for direct access.
  2. Describe clinical criteria for switch access, including 1 and 2 switch scanning and scanning strategies.
  3. Describe clinical criteria for eye gaze access.
Whose Job is This?

- Often an Occupational Therapist determines the best access method, as well as device placement and mounting
- It may be whoever has these skills on the team

Access Methods

- Direct
- Mouse
- Eye Gaze
- Switch

Access Methods

- The following varies by SGD brand and model:
  - Access methods supported
  - How access method controls SGD
  - Programming options
Direct Access

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

- Clinical Indicators
  - Requires accuracy, finger isolation
  - For the required amount of vocabulary
  - Requires sufficient activation pressure
  - Requires ability to release (stability)
  - Vision
Direct Access

- Facilitators
  - Positioning
  - Pointers
  - keyguards

Direct Access

- Facilitators
  - Splinting
    - Wrist alignment
    - Finger isolation

Direct Access

- Pointers
  - Hand held
  - Splint or universal cuff mounted
  - Head mounted
  - Chin mounted
Direct Access

- Pointers
  - If a tablet or even smart phone based SGD is being used, the pointer must have a specialized end to activate the device
  - It must be conductive

Direct Access

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

Direct Access

- Programming
  - Activation on contact or release
  - Activation Acceptance time
    - Allows client to move across display without accidental activations
  - Audio feedback
  - Choices may differ on tablet based devices
Mouse Access

• Definition
  • Hybrid access method in which movement of the mouse is translated into movement of a highlight or cursor over specific vocabulary options
  • Typically vertical, horizontal and diagonal movement is recognized
  • If SGD is a computer, mouse acts like a computer mouse

Mouse Access

• What about those tablets?
  • iPads do not accept mouse input at this time
Mouse Access

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

Most clients having the dexterity to use a standard computer mouse can directly access a SGD.

- Joystick mice
  - Provides stability of a joystick and the maneuverability of a mouse
Direct Access: inefficient
• Movie #1

Joystick Mouse Access
• Movie #2

Joystick Mouse: screen view
• Movie #3
Mouse Access

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

Mouse Access

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

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
    • Some clients may also be able to use eye gaze
Mouse Access

- Clinical Indicators:
  - Vary with mouse type

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

Mouse Access

- Programming
  - Selection Method
    - Dwell or Pause
    - Switch Activation
  - Speed
    - Typically programmed on SGD
    - Keep the cursor on the display!
    - May be helpful to program “resting” areas for the cursor
Programming

Eye Gaze Access

- Definition
- Clinical Indicators
- Facilitators
- Programming

- Definition:
  - Eye movement is translated into cursor movement
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

Eye Gaze Access

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

Eye Gaze Access

• Programming
  - Selection Method
    - Dwell or Pause
    - Switch Activation
      - Head mounted option
  - Speed
    - Dependent on speed of eye movements
Switch Access

- Definition:
  - Indirect access method
  - 1 – 2 switches are used with a specific scanning strategy to move to a desired vocabulary choice and select

Switch Access

- Clinical Indicators:
  - When client cannot use the other access methods
  - Least efficient method...most of the time
  - Other access methods may limit vocabulary
  - Any switch type or location
Where do I put the Switch?

- For more information, see Switch Assessment at OccupationalTherapy.com
- In general, an ideal switch site uses a small, isolated and volitional movement

Switch Access

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

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

- Programming
  - Scanning Pattern
  - Auto scan, single switch
  - Linear
  - Row Column
  - Column Row
  - Quadrant
- *movie time

Switch Access

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

Programming

[Diagram of programming interface]
Assignment Time!

- Set aside some time. Set up a SGD with each of these access methods and try them out. Play with the programming to see how this affects your performance.

A bit more Access…

- Access through the power wheelchair driving method
- Why?
- Many clients using power wheelchairs are non-verbal, requiring a SGD
- Many of these clients have limited access and may not be able to use separate access methods for each AT device
Interfacing

- Interfacing connects the SGD and PWC and uses the PWC electronics to share the driving method to access the SGD

Pros:
- Streamlines access when access methods are limited
- Shares a strong access method

Cons:
- The driving method may not be the optimal method for SGD control
- More expensive
- More complex
Interfacing

- How?
  - Interfacing component plugs into the PWC electronics
  - Varies with electronics package

Interfacing

- How?
  - Interfacing cable plugs into the Interfacing component

Interfacing

- How?
  - Interfacing cable plugs into the SGD
Interfacing

• How?
  • Client uses changes “Mode” of PWC from Driving to Auxiliary
    • Terminology varies with electronics package
    • Switches now send signal to SGD
    • Client then changes “Mode” of PWC back to Driving

Interfacing

• When not to do this:
  • If the client can use Direct access efficiently
  • Joystick drivers can often use Direct Access
  • Joystick driving is much different than Joystick access on a SGD
  • precision

Questions?
Thank You!

References


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