If you are viewing this course as a recorded course after the live webinar, you can use the scroll bar at the bottom of the player window to pause and navigate the course.

This handout is for reference only. It may not include content identical to the powerpoint. Any links included in the handout are current at the time of the live webinar, but are subject to change and may not be current at a later date.

INTERFACING SPEECH GENERATING DEVICES WITH POWER WHEELCHAIRS

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

Access to Independence

Introductions

- Who I am

What we are Covering Today:

- Interfacing
- How to control an external assistive technology device through the drive control
- Pros
- Cons
- Components required
- Programming required

M. Lange 2.2016

Learning Objectives

- After this course, participants will be able to:
- List 3 assistive technology devices that can be interfaced with a power wheelchair.
- List 2 electrical components required for interfacing.
- Describe clinical advantages and disadvantages to interfacing speech generating devices.

M. Lange 2.2016

What can be Interfaced?

- Speech generating devices (SGDs)
- Tablets
- External mouse emulators
- External EADLs

M. Lange 2.2016

Why is this Important?

- Many clients who use a power wheelchair and a speech generating device has limited access options
  - i.e. limited switch sites
- Interfacing shares an access method, streamlining access and providing control of multiple AT devices

M. Lange 2.2016

Whose Job is This?

- This is typically a team effort
- The supplier acquires funding, orders and programs the power wheelchair
- An Occupational Therapist or other team member determines optimal PWC and SGD access. This team member may also determine if Interfacing is indicated.
- The Speech Language Pathologist recommends the optimal SGD and needs to be aware that Interfacing is an option for a client, when this is clinically indicated and why this is important

M. Lange 2.2016

Yikes!

- This information can be very technical and overwhelming
- Let's put a face on things to introduce this topic…

M. Lange 2.2016

Case Study

- Sally
  - Age: 8 years
  - Diagnosis: cerebral palsy
  - Driving a power wheelchair using a Head Array
  - Accessing her SGD using a left head switch

M. Lange 2.2016

Case Study

- Sally
  - Problem: Sally doesn't have another means to drive the wheelchair efficiently and has been accessing her SGD very well with a left head switch
  - Solution: Share the left head switch! "How?" Interface!
  - More in a bit…

M. Lange 2.2016

Poll Time!

- Are you Interfacing as a part of your job?
  - Yes
  - No
  - I want to!

M. Lange 2.2016

Advantages of Interfacing

- Many technologies work together
- Streamlines access for individuals with limited switch sites and control
  - i.e. Sally
- Allows strong switch sites to be used for more than one function
  - i.e. Sally
- Interfacing may be less expensive since additional access methods are not needed

PROS

M. Lange 2.2016

Disadvantages of Interfacing

- If interfacing is too difficult and/or does not work well, people will shy away from it. It is challenging to find experts in this area.
- The system is more interdependent
- Back-up access methods required outside of power wheelchair
  - i.e. Sally's Manual Wheelchair
- Interfacing adds to the cognitive load
  - memory and sequencing
- Interfacing can be difficult visually or for those who do not read English
  - PWC display
-

CONS

M. Lange 2.2016

Disadvantages of Interfacing

- Interfacing may add to access requirements
  - if only 1 item is being interfaced, adding a reset switch may be no different than adding another control switch
  - the same switch may be used in a very different manner
    - sustained contact for driving, quick release
    - momentary contact for scanning, quick activation

M. Lange 2.2016

Disadvantages of Interfacing

- Sharing an access method may compromise access efficiency
  - Interfaced method may not be optimal access method

M. Lange 2.2016

Components Required

- Interfacing component
- Interfacing cable

- Supplier orders these and installs

M. Lange 2.2016

Components Required

- Interfacing component
  - MK 6i: Aux1/2 or Aux3/4
  - R-net: Input/Output Module (IOM)
  - Q-Logic: ECU Module

M. Lange 2.2016

Components Required

- Interfacing cable
  - Several manufacturers
  - Adaptive Switch Labs (ASL) 802 series

802-4

802-2 L/R

M. Lange 2.2016

How Does It Work?

- Client puts chair in an Auxiliary Mode to send a signal through the Interfacing Component
- Same as accessing power seating functions
- Some electronics require the auxiliary port to be activated with a programmer

- Ok, that's confusing. I wish I could see it…

M. Lange 2.2016

Movie Time!

- Part 1

M. Lange 2.2016

Movie Time!

- Part 2

M. Lange 2.2016

Movie Time!

- Part 3

M. Lange 2.2016

Questions?

M. Lange 2.2016

Interfacing Speech Generating Devices

M. Lange 2.2016

Interfacing Communication Devices

- Pros
  - streamlines access
  - shares a strong access method
  - SGD access method does not have to be moved to the power wheelchair, it is already there!

M. Lange 2.2016

Interfacing Speech Generating Devices

- Cons
  - May compromise access efficiency if shared switch cannot be accessed well for scanning
    - Important to use a strong switch site
  - Cables required
  - Need to provide a back-up access method when not in power wheelchair
  - Do not use with Standby

M. Lange 2.2016

SGD Access Methods

- Direct
  - don't interface
  - This would compromise access efficiency
  - Efficiency = speed + accuracy

M. Lange 2.2016

SGD Access Methods

- Scanning
  - single or dual switch
  - use cable with 1 or 2 switch jacks

M. Lange 2.2016

SGD Access Methods

- Joystick
  - 9 pin to 9 pin cable
  - Rarely used on SGDs anymore

M. Lange 2.2016

SGD Access Methods

- Mouse
  - mouse emulator required for interfacing
  - Built-in on many PWCs or external emulator

ASL

M. Lange 2.2016

Questions?

M. Lange 2.2016

Case Study: Sally

- Back to Sally…
- Age: 8 years
- Diagnosis: cerebral palsy
- Driving a power wheelchair using a Head Array
- Accessing her SGD using a left head switch

M. Lange 2.2016

Case Study: Sally

- Problem: Sally doesn't have another means to drive the wheelchair efficiently and has been accessing her SGD very well with the left head switch
- Can use a Reset switch by her left hand
- Solution: Interface! How?

M. Lange 2.2016

Case Study: Sally

- What components will be required?
  - Head Array
  - Mode/Reset switch
  - Interfacing component
  - Interfacing cable (ASL 802-1 L)

M. Lange 2.2016

Case Study: Sally

- Connections
  - Mode switch plugs into display or main electronics
  - Interfacing component plugs into electronics
  - Interfacing cable plugs into a port on Interfacing Component (9 pin) and into SGD switch port

M. Lange 2.2016

Case Study: Sally

- What programming will be required?
  - Turn on port 1 of Interfacing Component, if required
  - Choose transmission method, if required
    - *Momentary
    - Latched
    - *Communication
      - Allows for diagonal control (mouse)
      - Speeds up transmission slightly

M. Lange 2.2016

Questions?

M. Lange 2.2016

Let's Kick it Up a Notch!

- Paul
- Age: 25 years
- Diagnosis: cerebral palsy
- Driving a power wheelchair with left head switch and scanning
- Using left head switch for SGD

M. Lange 2.2016

Case Study: Paul

- Goals: better access method for driving, speed control, power tilt, access to SGD, access to computer, EADLs
- Problem: Paul only has one switch site and many features and devices to control

M. Lange 2.2016

Case Study: Paul

- Solution: 2 year solution!
- Evaluated for new access method to power wheelchair: 3 touch switches in a splint
- Evaluated for mode/reset switch location: left side of head

M. Lange 2.2016

Case Study: Paul

- What components will be required?
  - Three touch switches in splint
  - Mode switch by left side of head
  - Interfacing component
  - ASL 802-2 (L/R) interfacing cable

M. Lange 2.2016

Case Study: Paul

- Connections
  - Mode switch plugs into display or Interfacing Component
  - Interfacing Component connects to electronics
  - Interfacing cable plugs into port on Interfacing Component (9 pin) and into SGD switch jack (left was used until Paul fatigued, then he switched to right. He used a Y adaptor so he could switch independently)

M. Lange 2.2016

Case Study: Paul

- What programming will be required?
  - Determine method to access Reverse
  - Determine method to access Speed
  - Determine method to get to actuator mode for control of power tilt. Choose directional switches to control tilt (L/R)
  - Enable Interfacing Component port, as needed
  - Choose Transmission speed, as needed

M. Lange 2.2016

How Did it Work?

- Drive Mode: switches in splint for Forward, Left, Right
- Reset: Forward toggles to Reverse
- Reset: Left and Right change Drives to change Speed
- Reset: Left and Right control Tilt Up and Tilt Down
- Reset: Left or Right send signals to SGD
- Reset: Drive Mode

M. Lange 2.2016

Questions?

M. Lange 2.2016

Take Home Message:

- You do not need to remember exactly how to interface
- Do remember:
  - Interfacing is possible
  - Interfacing can allow a client with limited access to share an access method and control multiple AT devices
  - Your input is valuable in determining whether interfacing is clinically indicated
    - Particularly if interfacing may compromise access and, ultimately, communication

M. Lange 2.2016

Thank You!

M. Lange 2.2016

Contact Information:

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