continued

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continued

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INTERFACING SPEECH GENERATING	
DEVICES WITH POWER WHEELCHAIRS	
Michelle L. Lange, OTR/L, ABDA, ATP/SMS	
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Access to Independence	
M. Lange 2:016	1
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Introductions	-
• Who I am	
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M. Lange 2 2016	
What we are Covering Today:	
Interfacing How to control an external assistive technology device through the drive control	
• Pros	
Cons Components required	
Programming required	
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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.

What can be Interfaced?

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



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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





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

Yikes!

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

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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







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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. Large 2/2016	1
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	
DDCC.	
PROS	
	-



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

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



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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 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



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How Does It Work?		
Client puts chair in an Auxiliary Mode to send a signal through the Interfacing		
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		
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Movie Time!		
• Part 1		
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Movie Time!		
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Movie Time!	
• Part 3	
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Questions?	
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Interfacing Speech Generating Devices	
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Interfacing Communication Devices

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



Interfacing Speech Generating Devices

- 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



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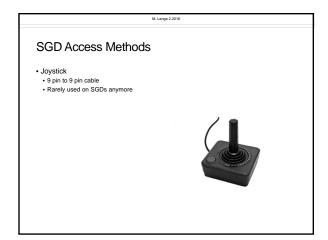
SGD Access Methods

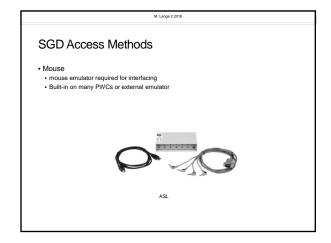
- don't interface
 This would compromise access efficiency
- Efficiency = speed + accuracy





L	M. Lange 2.2016
	SGD Access Methods
	Scanning single or dual switch use cable with 1 or 2 switch jacks

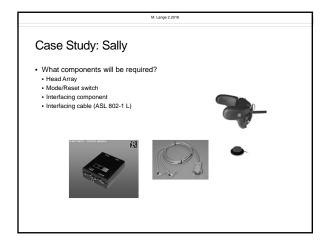


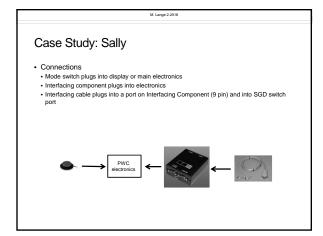




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Questions?	
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Case Study: Sally	
Back to Sally Age: 8 years	
Diagnosis: cerebral palsy	
Driving a power wheelchair using a Head Array Accessing her SGD using a left head switch	
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Case Study: Sally	
Problem: Sally doesn't have another means to drive the wheelchair efficiently	
 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?	
	1







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 controt (mouse)

• Speeds up transmission slightly



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Questions?	
Questions:	
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Let's Kick it Up a Notch!	
2000 Fillow it Op a Frotorii	
• Paul	
Age: 25 years	
Diagnosis: cerebral palsy Driving a power wheelchair with left head switch and scanning	
Using left head switch for SGD	-
AGI	
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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	
	-



Case Study: Paul • Solution: 2 year solution! • Evaluated for new access method to power wheelchair: 3 touch switches in a • Evaluated for mode/reset switch location: left side of head 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 Connectations - Mode switch plugs into display or Interfacing Component - Interfacing Component connects to electronics - 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)



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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	_	
	_	
	-	
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Questions?	_	
QUOSIIONS:		
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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	
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Thank You!	
N. Carro Source	1
M. Lange 2,2016	
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