



SWITCH ASSESSMENT, PART 1:
DETERMINING THE BEST SWITCH TYPE AND LOCATION FOR CLIENTS WITH MUSCLE WEAKNESS

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What are we covering?

- Assessment considerations
- Switch Types
- Switch Placement
- Case Study

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Assessment Considerations

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Assessment Considerations

- How does muscle weakness impact access?
 - Active range of motion or travel distance may be limited
 - Activation force is limited
 - Endurance is limited
 - Impacts repeated switch activations
 - Impacts force available over time
 - Impacts sustained force for driving PWC




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Assessment Considerations





- What diagnoses are characterized by muscle weakness?
 - Pediatrics:
 - Spinal muscular atrophy (SMA)
 - Duchenne muscular dystrophy
 - Congenital Myopathy
 - Other dystrophies
 - Adult
 - ALS
 - Other dystrophies



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Assessment Considerations

-  Determine where the client has movement
-  Determine how likely that movement will persist or be spared Based on movement typically spared in this diagnosis
-  Determine how much force the movement has
-  Determine how much endurance the movement has Repeatability (i.e., scanning)
Sustained force (i.e., PWC)

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Let's get Practical!

- Think of a client you are working with
- As we move through the webinar, think of **where** you may try and place a switch and **what type** of switch for access to assistive technology

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Ideal Switch Site




- An ideal switch site uses:
 - small movement
 - isolated movement
 - volitional movement
 - controlled activation
 - sustained pressure
 - controlled release
- Let's take a closer look!

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An ideal switch site uses:

- **A small movement**
 - This is not typically a problem for people with muscle weakness
 - The movement may only be possible, however, if the area is well supported
 - i.e., to support small finger movements, the forearm and hand may need support




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An ideal switch site uses:

- **An isolated movement**
 - This is not usually an issue for clients with muscle weakness
 - Movement does not typically result in overflow

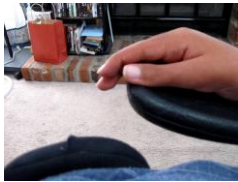


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An ideal switch site uses:

- **A volitional movement**
 - This is also not typically an issue
 - Non-voluntary movements are uncommon in muscle weakness



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An ideal switch site uses:

- **Controlled activation**
 - Activation travel
 - Reduced travel
 - Activation pressure
 - Reduced or no pressure
 - Speed
 - May be impacted by weakness
 - Accuracy
 - May be impacted by weakness




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An ideal switch site uses:

- Sustained pressure
 - In power mobility
 - Fatigue issues




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An ideal switch site uses:

- Controlled release
 - Timing (particularly in power mobility)
 - Consistency
 - Some people with muscle weakness have difficulty with release as they stabilize against the switch



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Questions?

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Switch Types

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Switch Types

- Mechanical
 - activation pressure
 - travel
- Electrical
 - no pressure
 - travel often required
 - less feedback



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Mechanical Switches


- Plate
- Light Touch Plate
- Not usually appropriate for clients with muscle weakness
 - Large plate switches
 - Lever
 - Pneumatic

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Plate Switches

- AbleNet
 - Jellybean
 - Specs
 - Buddy Switch
 - Formerly Tash
 - Takes more pressure than Jellybean

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The image shows three types of plate switches: a yellow Jellybean with a black base, a blue Specs with a black base, and a Buddy Switch with a black base and two pink buttons.

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Plate Switches

- Adaptation/Origin
 - Orby Switch



The image shows four Orby Switches in a 2x2 grid, colored yellow, green, blue, and red.

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Plate Switches

- Enabling Devices
 - Gumball
 - Mini Gumball
 - Compact




The image shows three types of enabling devices: a Gumball (blue, purple, green, yellow), a Mini Gumball (yellow, red), and a Compact (blue, yellow).

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Plate Switches

- Stealth Products
 - Mo-vis Twister switches
 - Light force



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Light Touch Plate Switches

- AbleNet Microlite
 - Personalize with Color
 - Also available through Stealth Products
- ASL
 - Ultra Light switch
 - Extremely light touch
 - Various color strips for top
 - 2 tap holes

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Light Touch Plate Switches


- AbleNet Plate Switch
- Adaptation Pal Pads
- AMDi
 - Moon Switch



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Light Touch Plate Switches

- Enabling Devices
 - Mini saucer



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Electronic Switches

- Proximity
- Fiberoptic
- Infrared
- Touch
- Sensor
- Piezo Electric Film (detects vibration)

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Proximity Switches

- AbleNet Candy Corn
 - Big and Little
 - Battery
- Adaptation HoneyBee
 - Battery
 - Adjustable range



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Proximity Switches - adjustable

- Arrays and single switch versions
 - Adaptive Switch Laboratories (ASL)
 - AMDi
 - Stealth Products i-Connect
 - Mo-Vis
 - Switch It!

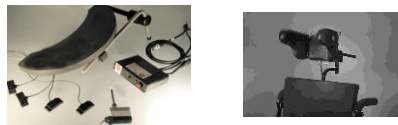
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Proximity Switches - placement

- Typically mounted at the head or hands



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Fiberoptic Switches

- Arrays and single switch versions
- Captures very small movements
- Fragile
- Rarely used with clients with increased tone
 - Adaptive Switch Laboratories
 - Stealth Products
 - Switch It!

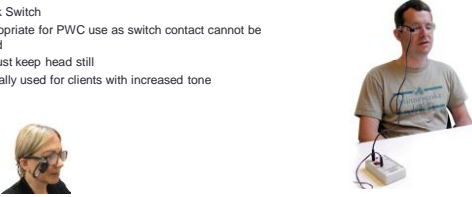
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Infrared Switches


- Enabling Devices
 - Eye Blink Switch
 - Not appropriate for PWC use as switch contact cannot be sustained
 - Client must keep head still
 - Not typically used for clients with increased tone



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Touch Switch

- AbleNet Plate Switch
- Adaptation Taction Pads
- AMDi
 - Picture Plate membrane switch



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Sensor Switches

- A sensor picks up muscle activity
- Not recommended for power mobility as vibration of the power wheelchair may activate the switch

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Sensor Switches

- Enabling Devices
- Tinkertron EMG Switch
- Control Bionics
 - Neuronode EMG switch



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Piezo Electric Film

- Vibration of a piece of film causes activation
- Not recommended for power mobility as vibration of the power wheelchair may activate the switch

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Piezo Electric Film Switches

- Adaptation
 - TableTapper
 - Also, a switch latch and timer
- Enabling Devices
 - Twitch



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Let's get Practical!

- What switch type do you think might work for the client you identified?

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Switch Placement

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Switch Site Hierarchy

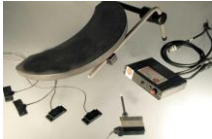
- Hands
- Head
- Mouth
- Feet
- Lower Extremities

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Switch Site Hierarchy

- Hands
 - under tray placement
 - finger movement




Proximity Switches


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Finger movement



Fiberoptic Switches




Micro Light


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Finger movement



Fiberoptic Switches




Micro Light

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Switch Site Hierarchy

- Head
 - Side of head



Spec




Jelly Bean

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Switch Site Hierarchy

- Head
 - chin
 - under chin
 - side of chin
 - can use jaw or head movement



ASL fiberoptic

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Switch Site Hierarchy

- Head, less used sites
 - eye brow – sensor switches
 - eye blink – infrared switches

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Switch Site Hierarchy

- Mouth
 - Sip and/or puff
 - Tongue
 - These are usually not possible with a client who has muscle weakness



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Switch Site Hierarchy

- Feet
 - Above foot (dorsiflexion)
 - Below foot (plantar flexion)
 - Sides of foot
- These locations typically require too large a movement

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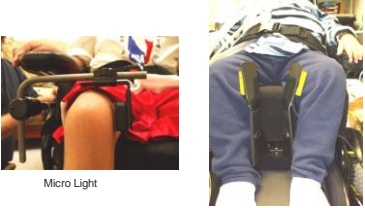
Switch Site Hierarchy

- Lower extremities
 - medial knee
 - lateral knee – typically too hard
 - superior knee – typically too hard

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Medial Knee



Micro Light

Proximity

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Let's get Practical!

- Where do you think you might try and place a switch on the client you identified?

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Questions?

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Case Study

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Case Study

- Julian
- 24 years old
- SMA, type 1
- Goal: switch access for SGD from wheelchair and bed




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Julian

- Julian has used switches since age 1 for play
- He started using a PWC at age 3 with a combination of mechanical and electrical switches

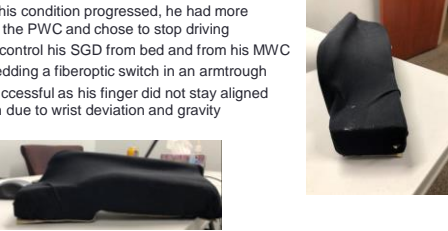


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Julian

- Over time, as his condition progressed, he had more difficulty using the PWC and chose to stop driving
- He needed to control his SGD from bed and from his MWC
- We tried embedding a fiberoptic switch in an armtrough
- This was unsuccessful as his finger did not stay aligned with the switch due to wrist deviation and gravity




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Julian


- We made a splint and attached the fiberoptic switch to the splint to keep him in alignment
- He can wear this in bed and in the MWC



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Julian



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Take Home Message

- Switch Access for people with muscle weakness requires:
 - Small activation travel
 - Little or no activation force
 - Ability to accommodate change
 - Postural support

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Questions?

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Thank You!

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