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Accessibility for Phones, Tablets, and Computers

Stephanie Hernandez, MOT, OTR/L
Megan Mahaffey, MOT, OTR/L, ATP
Kristen Mastony, MS, OTR/L, ATP
Olivia White, OTR/L, C/NDT

Knowledge and Compassion
Focused on You



Objectives

- Participants will identify two built-in accessibility features of phones and tablets to be used by persons with disabilities
- Participants will describe two assistive technology devices to be used by persons with disabilities to access a computer
- Participants will identify two strategies or devices a person with disabilities could use to access a smartphone.



What is Accessibility?

- Independent access to phones, tablets, computers, and home environments for individuals who are unable to achieve typical access due to an illness or injury
- Includes:
 - Use of built-in accessibility features on all devices
 - Use of dedicated assistive technology devices connected to phone, tablet, or computer
 - Use of commercially available products designed for people without disabilities



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- [Accessibility Sady](#)



Types of Access

- Direct Selection:
 - Voice
 - Stylus
 - Mouse emulator
- Indirect Selection:
 - Scanning
 - Switch access



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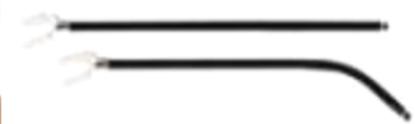
Phone & Tablet Access

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Low Tech Options

- Mouthstick stylus
- Stylus in a universal cuff
- iFaraday moldable
- Handizap
- Shapedad
- Pop Sockets
- Glove with finger cut off





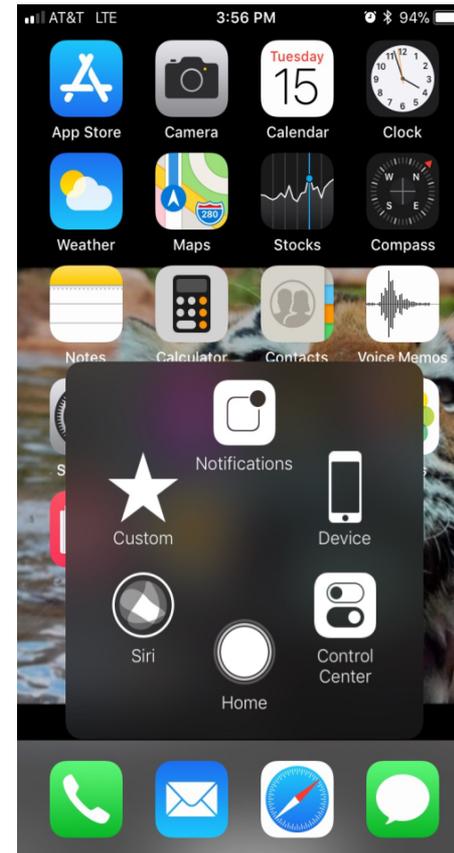
iOS Devices

- Apple does not allow third party access so there are limited options for accessibility
- Switch access if unable to use direct access method
 - Requires external interface
 - Bluetooth or hard-wired
- Built-in features



Built-In Accessibility Features for iOS

- Assistive Touch
- Touch Accommodations
- “Hey Siri”
- Automatic answer
- Compatibility with virtual assistants
- Switch Control
- Gestures
- Recipes
- VoiceOver





Interface for iOS

- Bluetooth
 - AbleNet Blue 2
 - Tecla-e
 - Power Wheelchair
 - AMAneo BTi **
- Hardwired
 - Tapio
 - Hook+ (endorsed by Apple)





Switch Control: iOS

1. Plug USB adapter into phone or ipad.
2. Plug Tapio USB into USB adapter. (It may tell use Tapio isn't supported, this is okay).
3. Plug desired switch into Tapio.
4. Open Settings on iphone or ipad.
5. Go to General > Accessibility > Switch Control > Switches
6. Select Add New Switch > External
7. When you see activate new switch tap your switch.
7. Give switch a name.
8. Select "Select Item"
9. Hit "Switch Control" to go back
10. Make sure scanning style is set to Auto
11. Can adjust auto scanning time
12. When all settings are selected make sure to turn "Switch Control" to on



Switches

Category	Description
Mechanical	Activated by application of force
Electromagnetic	Activated by receipt of electromagnetic energy such as light or radio waves
Electrical Control (EMG)	Activated by detection of electrical signals from the surface of the body
Proximity	Activated by movement close to the detector, without actual contact
Pneumatic	Activated by detection of respiratory airflow or pressure (sip and puff)
Phonation	Activated by sound or speech





Android Devices

- More options for connections and devices due to allowing 3rd party vendors
- Can be Bluetooth or hard-wired:
 - QuadJoy
 - Glassouse
 - Power wheelchair
 - Tecla Shield/Tecla-e
 - Zerotouch Mount
- Compatible with 3rd party apps (Sesame Enable)





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Built-In Accessibility Features for Android

- Assistant Menu
- Easy screen turn on
- Touch and hold delay
- Interaction Control
- Switch Access
- Bixby, Google Assistant, S Voice
- Google Voice Access
- Automatic answer
- Compatible with virtual assistants





Switch Control: Android

- ***These are general instructions for switch access for non-iOS devices. Each Android device may have slightly different features.**
- Connect switch to device
 - Connect via USB or Bluetooth interface device
- Go to *Settings* → *Accessibility* → *Switch Access*
- Select *Settings* → *Assign Switches for Scanning*
- Choose type of scanning under *Movement & Selection* (auto scanning, reverse scanning or step scanning)
- Activate switch and select *Save*
- Turn on switch access



Mounting





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Apple Accessibility Story

[iOS Phone Accessibility](#)



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Computer Access

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Windows Built-In Accessibility

- Ease of Access
 - Keyboard: Sticky Keys, Filter Keys, Toggle Keys, Onscreen keyboard
 - Mouse: mouse keys
 - Magnifier
 - Contrast
 - Size and spacing of font
 - Screen reader/Narrator
- Live Tiles
- Voice Commands
- Eye Control
- Cortana



Mac Built-In Accessibility

- Keyboard: Sticky Keys, Mouse Keys, Slow Keys, Dictation Commands
- Onscreen keyboard
- Magnifier
- Contrast
- Size and spacing of font
- VoiceOver
- Dwell Software
- Switch Control
- Siri



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Mouse Emulators

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Mouse Emulators: Head

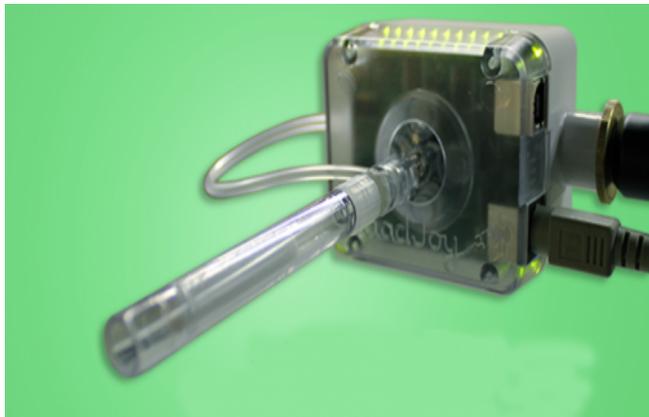
- Head Mouse Extreme
- Tracker Pro





Mouse Emulators: Mouth

- Quad Joy
- Integra Mouse
- Jouse
- Lip Sync
- GlassOuse





Mouse Emulators: Eyes

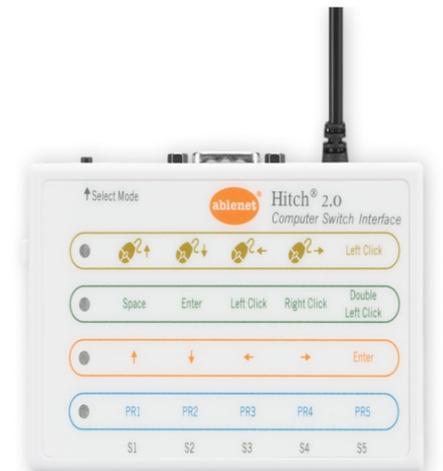
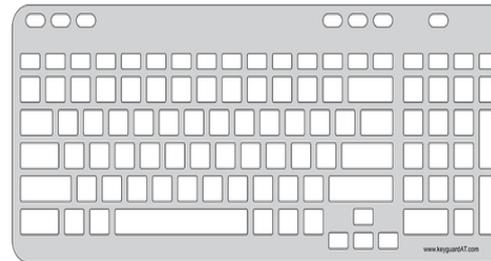
- Tobii
- Inclusive Eye Gaze





Computer Accessibility Accessories

- Hitch
- Quad Mouse
- Roller Mouse
- BIG Trackball
- Boomer Foot Mouse
- Key Guards
- Styluses
- Adaptive keyboards
- Dragon Dictation





Case Study

Eric is a 50 year old male with C5/C6 tetraplegia from a fall and came to rehab after a prolonged hospitalization of 8 months post injury. He had bilateral elbow flexion contractures and an uncapped trach. He previously was an iPhone user, but was open to change, as he had used an Android in the past as well. He worked previously as a DJ, which he did from his Mac computer. He wants to be able to make a call, send and receive texts, and use his computer.



- We started with his own device and set him up with a **switch on his iPhone** under his elbow. He picked it up very quickly and was successful with it.
- Tried **Sesame Enable** app on Android device.
- Preferred the **Glassouse** and wanted to transition between his computer and phone easily.
- Provided with education to have vendor Bluetooth connect phone to power wheelchair at seating clinic when his purchase chair arrived.
- Phone mounted to power wheelchair and bed using modular hose.



Case Study

Mary is a 56 year old female with a history of Reversible Cerebral Vasoconstriction Syndrome (RCVS) with multiple small strokes resulting in severe visual deficits, no right/left discrimination, poor body awareness, and poor awareness of body in space. As well as significant cognitive deficits. Smartphone accessibility recommendations for Mary are:



- Tried **Siri** for voice commands.
- Tried a **Bluetooth earpiece** that was voice activated.
- Tried **Apple Watch** on left wrist providing tactile feedback of vibration for incoming phone calls, alarms, reminders, etc.
- Set up **Call Audio Routing** on iPhone to default to “speaker” and **Auto Answer**. Set up **Do Not Disturb** to allow only those listed under “favorites” to call.
- Used a **flexible selfie stick** to mount phone in her left field of view. She could then see the red button to end call.



Case Study

Mark is a 14 year old male with chondrodysplasia punctata 1, X-linked recessive (CDPX1). He presented to acute rehab after decreased function of unknown etiology over the last few months. He now only has trace movement in bilateral upper extremities. He has frequent spasms resulting in excessive full body extension. He has some neck control, but fatigues quickly. He was an avid gamer prior to recent decline in function. He has an iphone and ipad, but he is no longer able use them. He is also unable to play the Xbox controller or computer.



- Set up **Tapio** and two **Buddy Buttons** on headrest of his manual wheelchair to control iPhone and iPad.
- **Modular hose** used to attach his phone to manual wheelchair.
- Tried a **Permobil Power Wheelchair** that he was able to drive using a head array.
- Set up the switches of head array to control iPhone when in bluetooth mode on power wheelchair.
- Used a **RAM mount** to attach his phone to the Permobil Power Wheelchair.
- Used **Glassouse** to control a Mac computer.

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MedStar National
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- Stephanie Hernandez
 - stephanie.hernandez@medstar.net
- Megan Mahaffey
 - megan.l.mahaffey@medstar.net
- Kristen Mastony
 - kristen.r.mastony@medstar.net
- Olivia White
 - olivia.g.white@medstar.net