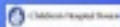


# Alternative Access, Positioning and Mounting: The Role of OT in AAC

Susanne S. Russell, MS OT  
Augmentative Communication Program  
Children's Hospital Boston



## Physical Access (Motor) Aspects of AAC pose some of the greatest challenges

•



## OT is member of interdisciplinary team

- consumer and family/care providers/speech language pathologist
- Speech language pathologist
- Developmental/educational staff
- Medical Specialists
- Insurance, Manufacturers, Equipment Suppliers



## OT domains of assessment

- Sensory-motor assessment
- Positioning
- Identification of multiple control sites
- Mounting and integration

## Primary Roles of OT

- AAC team member
- Clinical assessment, intervention and training (initial and on-going, as needed)
- Educator: training consumers/care providers and local team members
- Consumer advocate
- Interface between consumer, related personnel at home, school, work as well as manufacturers and educational/medical team members.

## Components of Access Assessment

- Assessment of sensory motor status
- Assessment of seating and positioning
- Observation and review of current functioning

## Important Background Information

- medical diagnosis - static or progressive?
- identification of related symptoms
- medications and impact upon well-being, alertness and function
- vision and hearing status
- neuromotor status and related issues
- positioning equipment and related positioning accessories

## Medical diagnoses

- Cerebral palsy: largest population, underlying movement disorder is unifying feature.
- Muscular dystrophies or congenital myopathies
- Spinal muscular atrophy
- Genetic and metabolic disorders
- Mitochondrial diseases
- Spinal cord injuries
- Friedreich's ataxia
- Juvenile Huntington's disease
- Any number of other conditions

## Movement Disorders

Are a group of diseases that affect the ability to produce and control body movements.

Every body movement requires a series of interactions between the brain, spinal cord, nerves and muscles.

Movement disorders are caused by abnormal function (damage or malfunction) in the components involved in movement (i.e. cerebellum and basal ganglia)



## Adverse Features of Movement Disorders

- abnormal muscle tone
- movement disorders (i.e. paralysis, rigidity, spasticity)
- residual existence of primitive reflex patterns
- abnormal muscle tone (i.e. spasticity, dystonia, athetosis, choreo-athetosis, tremors or mixed tonal states)
- movements are largely dominated by primitive, involuntary reflex patterns
- inability to execute non-fatiguing, automatic, graded voluntary movements
- attempts to control voluntary movements are extremely difficult and demanding.

## Tone Management Options

1. Positioning components
2. Pharmaceutical management (oral medications)
3. Botox and/or Phenol injections
4. Intrathecal Baclofen pump



## Strategies for minimizing adverse effects of movement disorders

- careful attention to seating-positioning features within adaptive stroller or wheelchair
- elbow protractor pads on tray
- headrest
- trunk laterals
- trunk harness
- contoured/molded seat and back cushions
- tilt in space feature and/or recline
- dynamic vs static seating system

## Importance of Positioning

- achieve good orthopedic alignment
- enhance comfort, breathing and support
- minimize adverse effects of movement disorder
- assist with interactions with AAC displays/tools

### Positioning, good



### Positioning, poor



## Positioning and Mobility Options



## Positioning Supports: Trunk and Head



## Positioning assists: HEAD



## Impact of positioning on access

- direct selection options should always be targeted first
- person's positioning can facilitate less effortful, more efficient access.

## Physical Access Options:

Direct Selection  
Indirect Selection (Switch)

## Control Sites Hierarchy

- Eyes
- Hands
- Head
- Knee
- Foot

## Direct selection access options

- isolated finger pointing
- pointing response using handheld pointer, head stick, mouth stick or other adapted pointer.
- any computer mouse, trackball, joystick or alternative mouse input for cursor control. Includes head tracking, eye tracking and optical pointing.

## Direct selection- hand



## Direct Selection Access, hand





## Direct Selection, low tech



## Computer inputs



## Alternative computer inputs



## Direct selection: Eye tracking



## Indirect Selection

i.e. Switch access: when person's motor abilities do not support direct selection options

## Switches



Inputter Bluetooth TMC Switch



SCATR



## Sue's top 3 switches



## Functional Switch Access

- Functional switch use<sup>2</sup> requires that the user is
- aware of the switch
- understands that the switch represents a means to a greater end
- capable of getting ON and OFF the switch, and attending to the resultant feedback.

## Switch placement guidelines

- DO NOT place switch in the path of an involuntary movement pattern!?
- Reliable, consistent switch access is frequently not a realistic goal (as many persons exhibit movements which are "inconsistently consistent." One way of circumventing this situation is to identify multiple sites and ease of timely, secure switch placements.
- ease and flexibility of fine-tuning switch placement
- focus of initial switch activities should be on positive, fun interaction provided by activity. (not p[er]fect switch setup and use!)

# Functional Activities



## Switch placements: HAND



## Switch placements: HEAD



## Switch placements: KNEE and FOOT



## Common switch issues

- Placement of a large switch too close, and ends up getting activated by extraneous, involuntary movements
- Sensory motor aspects of switch hits...
- Seems counter intuitive, but switch needs to be situated slightly beyond child's reach, to minimize involuntary hits and to build intentionality
- Frequently by limiting upper body involuntary movements, smaller, more controlled distal movements can be achieved.
- Switch should be present but not so motivating that child
- Comments relating to switch features: color, built in feedback, durability mounting options

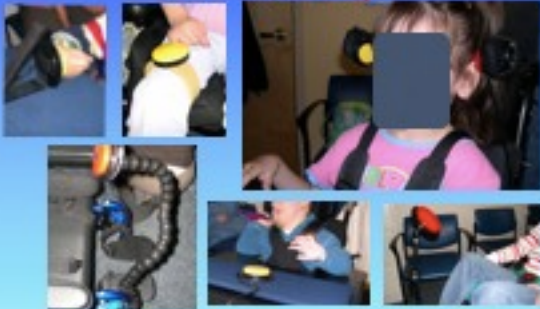
## Mounting

Person/Interface/Communication Display

### Switch Mounting Options



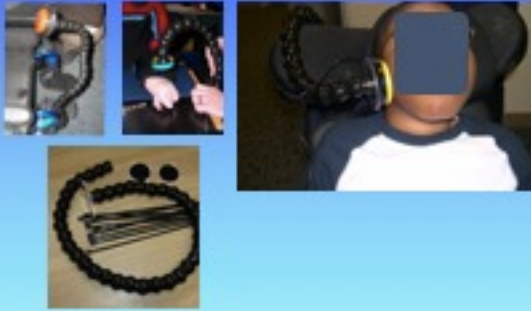
### Switch mounting



### Switch mounts, custom



### Loc line mounts



### Two switch setups



### AAC device mounting options



## Wheeled cart to transport AAC device



## Making Communication Accessible



## Accessible Communication Displays





## Custom adaptive designs



## Putting it all together

Carolina

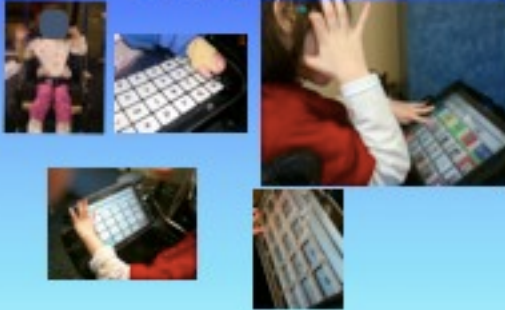
Diagnosis: rare congenital myopathy slowly progressive  
Vision and hearing: fine  
Motor Status: only capable of moving finger and eyes  
Cognition: Intact  
Bilingual in Spanish and English  
Honors Student



## Control sites: finger and eyes



## Case Study: Jamie



## Control site: right hand, joystick



## Computer Joystick trials



## Physical Access Thoughts

- strive for direct selection access; at very minimum get person setup with a switch/equipment to start giving them the tools to participate, explore, experiment
- identify multiple control sites and access setups - to support task participation/person's fatigue and physical variability over the course of the day
- create hierarchy of access options (start with focus should be on enjoyable interaction and positive outcome, not on phuprfect interactions with the switch or other access tool)
- Mastery comes with lots of exposure and personal experience...and learning new motor patterns!!

## Clinical Insights: Physical Access

- when goal is working on motor control, activity should be fun!
- always target direct selection access, then switch access
- strive to identify multiple control sites and related access tools
- get kids up and running asap using a jelly bean switch for fun activities!

## Practical Suggestions

- Seek assistance from others who work regularly with this population.
- AAC mindset: different way of approaching function.
- Lots of exposure, modeling and practice required!! These skills do not occur spontaneously!!

## Contact information

Susanne S. Russell MS OT  
Augmentative Communication Program  
Childrens Hospital Boston  
[susanne.russell@childrens.harvard.edu](mailto:susanne.russell@childrens.harvard.edu)