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

Suzanne 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 ongoing, as needed)
- Educator: training consumer/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
- Neurologic 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, choreoathetosis, tremors or muscle contractures)
- 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. Botulinum and/or Phenol injections
4. Intrathecal Baclofen pump

Strategies for minimizing adverse effects of movement disorders

- Careful attention to seating: positioning features within adaptive splints or wheelchairs
- Elbow protractor pads on tray
- Headrest
- Trunk lateral support
- Trunk harness
- Contoured/molded seat and back cushions
- Tilt in space feature and/or recliner
- 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 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
Sue's top 3 switches

Functional Switch Access

- Functional switch use 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 pluperfect switch setup and use).
Functional Activities

Switch placements: HAND

Switch placements: HEAD
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
- Frequent physical 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
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
Homes Soudere

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 set person up 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 perfect 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
Children's Hospital Boston
susanne.russell@childrens.harvard.edu