

The Effect of Seated Positioning on Access to AAC For an Adolescent with Cerebral Palsy

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Introduction

- Communication is fundamental to participation in all aspects of life [1]
- Children with cerebral palsy (CP) may have difficulty speaking and require AAC [2]
- AAC access is the techniques an individual uses to physically control his or her AAC system [3]
- Seated posture has long been thought to influence an individual's motor skills [2]
- Costigan and Light (2010) demonstrated that the conventions of functional seating improve upper-extremity range and motion for accessing AAC for children with CP

Functional Seating Guidelines [4]

1. A neutral or anteriorly tilted pelvis with a neutral hip-flexion angle
2. Weight-bearing surfaces that support the feet and thighs
3. Vertical alignment of the upper body

Objective

Investigate the effect of seated positioning on the accuracy (in both initiation and termination) as well as the efficiency of access to AAC for an adolescent with athetoid CP

Method

Design

- Single-subject, alternating treatments design
 - Intervention 1- old seating position (OSP)
 - Intervention 2- new seating position (NSP) following the conventions of functional seated position [4]

Participant

- 14-year-old male with athetoid CP
- Frequent involuntary muscular movements

Procedures

- Sessions held 1x/week for 1 hour
- Participant completed 10 trials of target selection in both NSP and OSP each session
- During each trial:
 - Researcher said "Trial X, go"
 - Participant attempted to select the target (jellybean switch) in order to activate an iPad to play personally motivating music videos or movies
- Sessions were video recorded and coded for all dependent measures by the first author after each session
 - Twenty percent of trials coded for reliability

Dependent Measures

- Accuracy of target selections
 - *Did the participant initiate and terminate the movement*
 - Initiation – successful activation of the iPad via the switch
 - Termination – no additional activations of the iPad via the switch in a five second period
- Response time to accurate selections
 - *How long did it take the participant to activate the iPad via the switch*

Comparison of OSP and NSP in Relation to the Functional Seating Guidelines



OSP

1. Ensure equipment promotes functional weight bearing

- (a) Appropriate base of support ✓
- (b) Horizontal or forward sloped seat ✗
- (c) Vertical seat back ✗
- (d) 1-2 inch clearance between seat and back of knees ✗
- (e) Consistent contact between seat back and lower back ✗
- (f) Consistent foot support ✗

2. Position of the pelvis for stability and mobility

- (a) Neutral/slight anterior tilt ✗
- (b) Neutral lateral tilt and rotation ✗

3. Pursue proper body alignment

- (a) Align the trunk, neck, and head ✗
- (b) Position lower extremities to support upper body ✗
- (c) Provide external supports to upper body as needed ✗



NSP

1. Ensure equipment promotes functional weight bearing

- (a) Appropriate base of support ✓
- (b) Horizontal or forward sloped seat ✓
- (c) Vertical seat back ✓
- (d) 1-2 inch clearance between seat and back of knees ✓
- (e) Consistent contact between seat back and lower back ✓
- (f) Consistent foot support ✗

2. Position of the pelvis for stability and mobility

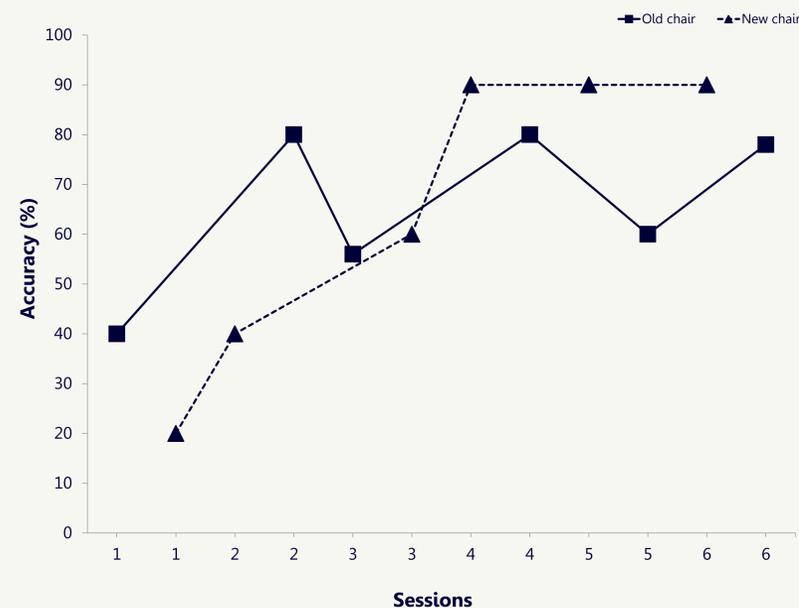
- (a) Neutral/slight anterior tilt ✓
- (b) Neutral lateral tilt and rotation ✓

3. Pursue proper body alignment

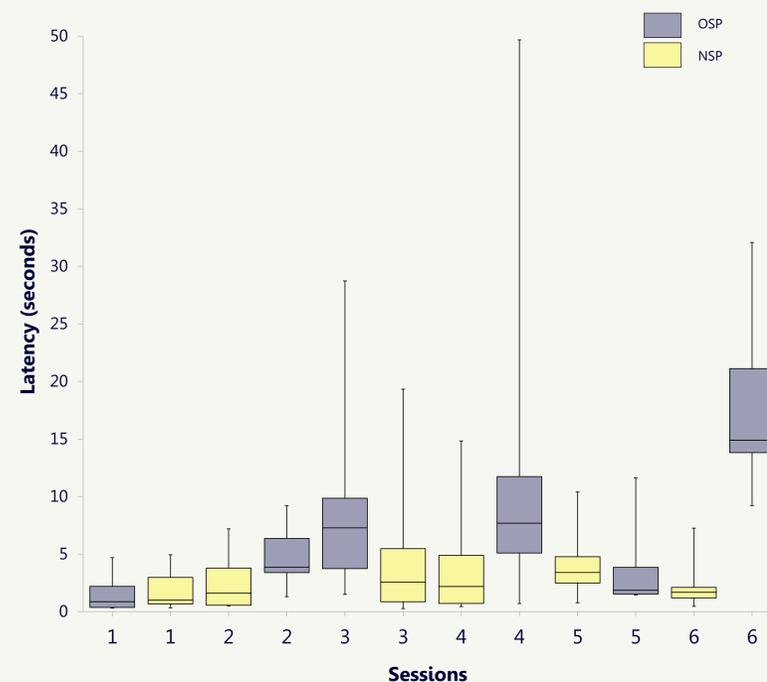
- (a) Align the trunk, neck, and head ✓
- (b) Position lower extremities to support upper body ✓
- (c) Provide external supports to upper body as needed ✓

Results

Accuracy of Target Selections



Response Time to Accurate Selections



Clinical Implications

- Investigating an individual's access is a critical part of an AAC assessment
- When assessing access, consideration should be placed on the individual's ability to initiate the target movement as well as his/her ability to terminate the movement
- Individuals with complex motor needs require an extended amount of time and multiple practice opportunities to learn new motor responses under new conditions
- Given the importance of seating and positioning, it is critical to involve a multidisciplinary team including an occupational or physical therapist in the provision of AAC services

Future Directions

- Additional research that investigates the effect of seated position on AAC access is needed to ensure the generality of results
- Future research should...
 - Incorporate participants with varied motor skills
 - Incorporate other access methods
 - Investigate the effect of seating and positioning on the functional use of AAC in a real-world context
 - Evaluate the use of, and outcomes associated with, multimodal technology
 - Explore how selection accuracy and efficiency are impacted by the integration of multiple technologies

References

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