

"THE COMPLEX CLIENT"

A CASE STUDY HIGHLIGHTING THE INTER-RELATIONSHIP BETWEEN VISION, POSTURE AND MOBILITY

Jordan visited our technology center with his mother, and he was evaluated for seating and augmentative communication. His mother was concerned that Jordan, who is now 6 years old and attending school, was not able to stay seated in his wheelchair. He was in constant movement and seemed frustrated. The school team had provided a single switch which Jordan was able to hit, but with great effort. He was also tilting his head or leaning side to side despite the headrest supports the wheelchair supplier had recently put on his chair. Jordan's mother did not understand why he was not able to sit, attend school and stay seated in his wheelchair. Her main goal for Jordan was for him to participate in school and not be frustrated. This was his first year in a classroom setting, and she wanted it to be a good experience for Jordan.

Background:

Jordan is a 6 year old who presents with a primary diagnosis of cerebral palsy with dystonia and secondary diagnoses of development delay, spasticity, dysphagia, cortical visual impairment, history of hypoxic ischemic encephalopathy and seizures. This has resulted in dysarthria, a mixed receptive-expressive language disorder, and oropharyngeal phase dysphagia. As a result of these impairments, he is unable to maintain his own posture and requires external seating and positioning supports. He is unable to verbally express wants and needs or communicate with adults or peers without the assistance of augmentative and/or alternative communication strategies. Jordan is currently enrolled five days a week in a self-contained classroom where he receives physical, occupational and speech language therapeutic intervention services. In addition to school therapy services, he attends outpatient occupational and speech language therapy through his local children's hospital. Despite his many medical complications, Jordan is a very engaging and social child. He lives with his parents and a younger brother who are all attentive to his needs.

Physical Presentation:

Jordan presents with abnormal dystonic tonal patterns that affect his trunk and core muscles, bilateral upper extremities and which are exacerbated with excitement, effort and overstimulation. His upper extremity strength is decreased and not functional due to his dystonia, which produces constant motion. He demonstrates gross motor patterns with his bilateral upper extremities which he uses to hit large targets such as a BIGmack switch. At this time, Jordan, his parents and his school team agree that these methods are no longer meeting his expressive

communication needs. Jordan is demonstrating increased difficulty communicating with familiar and unfamiliar communication partners. He has good head control and is able to move his head on and off of his headrest. The impact of his muscle tone continues to be a struggle for his school team and they are finding it difficult to help him participate (see picture 1).

Seating and Mobility System:

Jordan uses a manual wheelchair, Quickie Zippie TS, with a custom seating system. His seating system includes a contoured back cushion with swing away lateral trunk supports, a contoured seat cushion, flip-up arm rests, contoured head support, pelvic positioning belt, anterior trunk support (chest harness) and a tray. He is dependent on his manual wheelchair for primary mobility at this time, as he

Most importantly, what can we, as clinicians, do to ensure our equipment recommendations are both functional and comfortable?

is not able to self-propel. During the evaluation, he was able to maintain an upright posture when provided with maximal seating support. He demonstrated the ability to reach and target a switch using gross motor movements, but his efficiency was limited due lack of support in the seating system.

Vision:

Jordan has a diagnosis of cortical visual impairment. Cortical visual impairment (CVI) is a neurological disorder in which there is damage to the posterior visual pathways and/or the occipital lobes of the brain resulting in visual processing issues. In CVI, the eye does not have any physical damage, but the area of the brain that interprets the signals does not function properly. Because of this, a child with CVI will often have a preferred and a non-preferred field of vision. It is typical that the child will attempt to move in and out of midline position in order to find their preferred field of vision. Jordan was demonstrating many of these characteristics during this evaluation. When he was looking at the computer screen, he fixed his head in a specific location and would then move back to place his head on his headrest. He did this repeatedly (see pictures 2 and 3).

Results and Considerations for his Postural Stability and Vision:

Jordan has dystonic movement patterns that were easily identified. However, it was his vision that had not been considered previously. Jordan was given several different technology devices during this session to see how he would respond. Looking at the computer screen and hitting a switch, he

would flex forward and attempt to stabilize with his right hand. When using an eye gaze augmentative device he postured in a similar way. Without stabilizing features on his chair and if not allowed to use dynamic movement patterns, he struggled physically to perform a task. The team determined that his preferred field of vision was in the upper right quadrant and in order for Jordan to visually interpret, he needed to position his head slightly forward, tilted to the right and gaze upward. Using seating supports that prevented this posture was working against Jordan's visual needs.

Equipment Considerations:

Jordan was struggling to stay in a seated position. He was sliding forward and did not have any pelvic stability. He was also reaching for his armrest pads, which were not fixed, but would flip up as soon as he attempted to grab them. This only added to his instability as he attempted to grab his seat cushion or anything else in his path. When a tray was placed on these armrests, the entire tray would move upward, causing significant instability. He did finally stabilize by leaning forward in the seating system. He was limited, however, by his anterior trunk support. The overall seating system and wheelchair did not provide any dynamic movement. With Jordan's dystonic movement pattern, he was able to activate a switch efficiently only if he was able to move dynamically.

The most difficult consideration for Jordan was how to add dynamic components to his current wheelchair. Two options were discussed with the family and the supplier. Jordan's wheelchair and seating system were only two years old. He was not eligible for a new wheelchair, but due to growth and functional needs, he was eligible for growth options, including new hardware for the wheelchair. Dynamic movement could be provided in a whole new dynamic wheelchair or added to the current wheelchair by adding a dynamic bracket to the back canes using a Seating Dynamics Rocker Back. Since Jordan moves in and out of his system frequently and has good head control, it was determined to use the dynamic bracket attached to the back cane. The seating system itself would then be static and stable.

Recommendations:

1. Dynamic Back Canes
2. Seat Cushion: Stability in the seating system is important for Jordan's foundation. Having a supportive seat cushion that provides full contact worked effectively for Jordan. A molded seat cushion was recommended as this decreased hip movement forward or side to side, but allowed for trunk and upper extremity movement.
3. Back Cushion: A custom contoured back with swing away lateral trunk supports allowed him to move in and out of his seat easily and the laterals acted as guides to stay within an area of independent trunk control.
4. Armrests: Fixed armrests were recommended

"THE COMPLEX CLIENT"
(CONTINUED FROM PAGE 51)

5. Lap Tray: A lap tray attached to the fixed arm rests provided an excellent stable surface. Attaching a stabilization bar also provided Jordan with an option to help position himself when activating his eye gaze system. Covering the tray with a black material is also recommended to decrease visual clutter, which is a common need for children with a CVI diagnosis (see picture 4).

6. Whitmyer Plush 10 head support with adjustable hardware provided enough support when he was either resting or seeking a barrier when extending in his wheelchair. He did not require any other head support components and would not tolerate any type of head strap. This additional support is not indicated with dystonic movement patterns and CVI since it would restrict movement required for him to reach his preferred visual field.

It is important to trial any set-up before making final recommendations. Jordan quickly understood the dynamic movement and adapted very quickly. Providing the appropriate supports for Jordan and allowing for dynamic movement allowed him to move in his seating system effectively. The other useful support for Jordan was a tray with a stabilization bar and fixed armrests.

Jordan is a very bright young man. For Jordan to only have access to low-tech options such as a single switch using gross motor movements was very limiting to his development and learning. Once he was provided with a dynamic seating system that allowed movement and stability, he was able to advance to higher levels of technology. He is now able to use an eye gaze system to access his communication device and his school team reports that he is less frustrated and is participating and interacting with his peers.

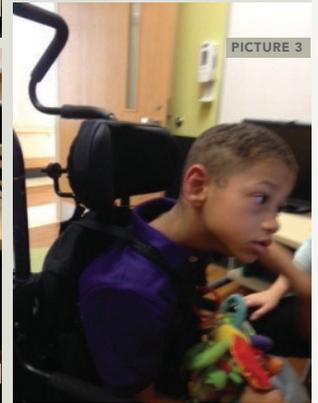
Understanding the visual needs of a client and how it impacts posture and movement, especially with a child with dystonic



PICTURE 1- DYSTONIC TONE



PICTURE 2- PREFERRED VISUAL FIELD



PICTURE 3- PREFERRED VISUAL FIELD WITH NOTED HEAD POSITION



PICTURE 4- TRAY WITH A STABILIZING BAR

movement, is critical. Incorporating dynamic movement components and stability for pelvic support is an excellent combination to facilitate function.

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