CHILDREN WITH VISUAL AND MOTOR IMPAIRMENTS: SPECIAL CONSIDERATIONS WHEN PRESCRIBING SPECIALIZED EQUIPMENT

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I, Catherine O’Leary, do not have an affiliation (financial or otherwise) with an equipment, medical device or communications organization.

As a therapist supporting children and their families in learning environments, the Person-Environment-Occupation (PEO) Model has assisted to provide a framework to address the child’s needs for occupational performance. The PEO Model is also helpful in addressing appropriate environmental adaptations and strategies to support the occupations of play, learning, movement, exploration of the environment and eating for children with visual impairment and motor issues. When the motor issues are only addressed, children are at risk of delay or further delay in their overall development. This focus on the motor delay due to muscle tone, orthopaedic issues or poor body awareness without taking into context his/her visual impairment leads to equipment prescription that is not the most appropriate.

**What is a Vision Impairment?**

Visual Impairment is an umbrella term which includes all types of visual diagnosis. They can be congenital or acquired. Visual impairments impact approximately 1/1000 children. Many children with physical disabilities also have a concurrent physical disability. Not all children who are visually impaired are blind or even have a visual acuity issues. Visual issues can include blindness, low visual acuity, cortical visual impairment, cerebral visual impairment, visual neglect or field loss, visual glare issues and visual processing issues.

**Visual Functioning:**

Visual functioning includes the ability to move your eyes, acuity of vision, “seeing” what is in front of you and then processing/categorizing that information for use later. Children with visual impairments can struggle with 1 or more of these issues. Common eye conditions of early childhood include Cortical/Cerebral Visual Impairment, ROP, Optic Nerve Hypoplasia, Albinism, Glaucoma and /or Cataracts and Colobama. Poor visual functioning can impact on preferred body positions, interest in moving and exploration of the environment.

**Movement Experiences for Children with VI**

80% of learning done when a child is young is through vision. Without vision we explore less, practice movement less and are at risk of fine motor and higher gross motor skill development delay. Vision loss can impact on the development of sensory awareness, spatial concepts, relationships between objects, locating objects in a room and independent movement. These areas are further weakened when there is an orthopedic or muscle tone issues. Children who also have a mobility issue expend a great deal of effort with moving their bodies and can be resistant to exploring the environment due to fear and lack of experience.

**Developmental Milestones for Children with Motor and Visual Impairments**

**Lying**

Lying in prone or supine for a child with visual impairment can be a scary position. Rolling in an open space is frightening and without context. Structured space increases the comfort of the child and the likelihood of movement practice. For children with neuro-atypical development, working against gravity is difficult. They are frequently pulled into gravity which prevents hand function needed for
tactile exploration. Rolling skills are limited by muscle control. Body on Body activities are supportive of learning to move. Facilitation on a ball or against a known adult can be a safe way to practice this movement.

4 point Crawling:
Children with VI require strong tactile skills to explore their world. When crawling, a child’s use of their hands is limited and they again are placed in a horizontal plan which can fill a child with unease. Crawling within a structure increases comfort and spatial awareness of themselves. It allows for orientation to the space. For children with motor impairments and VI, the control of motor skills required for crawling impact on the use of the visual system. Without crawling practice, children can have limited hand and shoulder function.

Sitting:
Children with motoric issues require specific postural support for both active and passive sitting situations. Children with VI require more information about their body in space. The use of supportive seating for sensory input is a requirement for fine motor and functional skill development. Children with limited motor and VI, may require extra postural support for cues to help them attend to the task at hand and not their position in space. So more cuing is better than less for a child with visual and motor issues.

Standing:
The need for continuous orientation in space can limit standing independence. Without a reference point or only having a small reference point (feet), standing can be a scary activity. When a child has both vision & mobility issues and require support for standing, upright vertical position is always best. If this is not a viable option, prone is preferred over supine positioning. Prone positioning can support visual activity but supine positioning changes the field of orientation and is not recommended. If supine is the only option the activities completed within the stander should not be require visual work.

Walking
Walking skills require many other supports to be in place. When a child has a motor issue, they require a significant amount of input and appropriate practice in the motor plan of walking. For a child with visual impairments, they require the environment to remain static so that they can have multiple exposures to the space for orientation and mapping out of the space. When a child is expected to do both at the same time (walk with efficient gait and explore a space) they may choose to not move. Since this is opposite the goal, the approach must be stepped and graded to meet their needs. Finally, if this child will be a White Cane user hands must be left free for using a cane when it is possible.

Steps:
- Address structural issues that impact on standing. This may include the use of strapping, taping or bracing.
- Address readiness to move. This may include wake up or calming activities and setting of a routine that is predictable. This may include an object schedule, song for beginning or end, use of a timer or a specified adult to support the child in the movement activities.
- Set up the environment for success. Address the equipment and purpose of each piece. Limit changing the environment.
- Provide as much support as needed for independent movement. The goal is independence so the child should be set up for independent movement with limited energy expenditure, especially at the beginning.
  - Start with full support (eg. Hopsa Dress, ring walker) to work on vertical orientation while leaving the hands free for orientation in space and tracing the environment with the hands
  - Increase weight bearing by lowering the supports
  - Provide movement without lower body support, leaving orientation in space supports such as the ring of the ring walker (without seat). Use walker for greater and greater amounts of time.
- Use gait trainers in a forward facing position to support balance and position in space. This is the time to work on Gait improvement.
- Increase use of time and duration using the walker. Orientation and Mobility Specialists can provide support with respect to other strategies for independent mobility at this point.

Vision impacts on everyone’s movement. When a child is also challenged by tone and proprioceptive issues appropriate equipment prescription must address both the vision and motor needs of the child.

**References**

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**Speaker Bio**

Catherine O'Leary is an Occupational Therapist providing support to schools, families and children in the Greater Toronto region. Currently, she works both for the Toronto District School Board and in private practice. Her previous experiences have led to an interest in vision and its impact on overall development, sensory challenges and feeding issues.