ROLES AND RESPONSIBILITIES OF VISION EDUCATORS (TVIS AND O&MS) WHEN LEARNERS HAVE CVI

Neurological Visual Impairment Division
AER Position Paper

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Teachers of students with visual impairments and orientation and mobility specialists provide essential services for learners with cortical/cerebral visual impairment (CVI). This paper will discuss the responsibilities and services of these professionals as they pertain to infants, toddlers, and school-aged learners who have CVI. Thus, the term "learner" is being used to represent these groups throughout this paper. Regarding the professionals, very often the roles and responsibilities outlined here are incorporated within the practice of teachers of the visually impaired and orientation and mobility specialists. When referring to both groups, we will use the term "vision educators". However, in some instances, we refer specifically to teachers of students with visual impairments. This verbiage is intentional to highlight responsibilities that fall directly to these teachers rather than to orientation and mobility specialists. Further, it is not our intention to debate terminology (i.e., cortical, neurological, or cerebral); instead we will use the term CVI when referencing the brain-based visual impairment regardless of age of injury and/or type of brain injury. While we acknowledge that we are only in the beginning stages of uncovering all there is to know about serving learners with CVI, we feel that we are at a critical juncture in which current professional practice can be informed by research. Further, coming together to identify common beliefs will serve to highlight points of agreement among professionals which can spur collaboration toward a common goal of moving our field forward. Our highest priority related to CVI must always be toward the pursuit of better services for all learners and their families. In conclusion, the purpose of this paper is 1) to acknowledge the foundational work that has been done, 2) to identify recommended practices based on research and current knowledge, and 3) to spur collaboration and agreement among all members of the educational team.

Please note: As an integral part of the team, families are included when the term "educational team" is used throughout this document.

We now know that CVI is the leading cause of visual impairment in developed countries (Solebo, Teoh, & Rahi, 2017). In the recent past, the medical community has worked to better understand the neurological underpinnings of vision including how CVI should be defined and how it presents in learners (Dutton, 2015; Fazzi et al., 2007; Good, 2007, 2009; Goodale & Milner, 1992; Merabet et al., 2017). Importantly, Jan, Groenveld, Sykanda, & Hoyt (1987) made a revolutionary suggestion when they indicated that habilitation might be possible for learners with CVI. In response, the educational community worked to better understand CVI and

the implications for practice (Jan, 2013; Dennison & Lueck, 2006; Love, 1994; Lueck & Dutton, 2015; Lueck, Hart & Dowrnbusch, 1999; Morse, 1990, 1999, 2001; Roman, 1996; Roman-Lantzy, 2018; Roman et al., 2010). While rehabilitative outcomes and methods are still poorly understood, continued investigation of potential intervention strategies remains a high priority in the educational field. Further, new research in the medical field, especially that which utilizes advances in neuroimaging, continue to broaden the medical perspective, which serves an important role in informing continued refinement of effective educational interventions (Lueck & Dutton, 2015; Merabet et al., 2017; Serdaroglu et al., 2004).

This foundational work by both the medical and educational communities is encouraging; but, perhaps more importantly, has served to foster a passionate pursuit of discovery related to meeting the needs of learners with CVI (i.e., Lueck & Dutton, 2015). As stated in this paper, we seek to build on these foundations in order to identify recommended practices based on research and current knowledge, and to spur collaboration and agreement among professionals. We begin this process with some agreed-upon tenets including, but not limited to, the following:

- We need to be cautious. A flexible process in evaluation and service delivery is needed; one approach does not apply to all learners.
- A quality assessment goes beyond examination of the use of vision; it also includes consideration for compensatory adaptations needed within the daily routine at times when the visual sense is not the primary mode for accessing information. This is especially true given that the visual function of learners with CVI generally improves over time (Good, 2007, 2009; Merabet et al., 2017; Roman-Lantzy & Lantzy, 2010). While functional vision is improving, learners are likely to need accommodations in order to actively participate in some daily routines. However, improvements in visual functioning cannot be guaranteed in all learners.
- Within the educational setting, vision educators have a responsibility that includes a) vision habilitation or rehabilitation (Lueck & Dutton, 2015), b) environmental adaptations, and c) staff training (Ely & Morse, 2018). Therefore, vision educators must remain current regarding research related to practices for use in habilitative and adaptive efforts (Ely, 2016). Further, vision educators must actively seek professional collaboration within the field of vision and related fields to best identify interventions that will serve the unique needs of each learner (Ely, 2016). In defining rehabilitation and habilitation, Dutton and Lueck state: "Rehabilitation takes advantage of capabilities gained prior to acquitted damage to the brain; habilitation progressively assists in the development of skills that have been affected by congenital damage to the brain or damage occurring shortly after birth" (2015, p. 14). Development of skills should be facilitated by the interventions of the vision educator.
- A transdisciplinary approach to assessment and service delivery is essential so that the needs of the whole learner can be considered. This

broad base of information will inform vision habilitative efforts as well as accommodative needs across the learner's daily routines.

The Role of Vision Educators

Vision educators (i.e., teachers of students with visual impairments and orientation and mobility specialists) must possess the appropriate qualifications in order to meet the complex needs of learners with CVI. Thus, vision educators must be able to equally address the needs of learners with brain-based visual impairments as well as learners with ocular visual impairments. It also is the vision educator's responsibility to make appropriate recommendations based on up-to-date knowledge of CVI given each learner's assessed needs. Since our understanding about CVI is evolving, this puts significant responsibility on the vision educator to remain abreast of current research and recommended practices.

In order to fully understand the needs of learners with brain-based visual impairments and make appropriate recommendations for services, vision educators must:

- understand the brain (including neuroplasticity and the interactions of the various parts of the brain) which, given the right conditions (supports and environments), may result in improved visual efficiency. In order to achieve this, vision educators must have an understanding of the anatomy and function of the brain, the interactions of the various systems, and the causes of CVI. "The visual system cannot function in isolation" (Lueck & Dutton 2015, p.124). Vision educators also must be aware of the potential for co-existing cognitive, motor, hearing, and other processing conditions. Moreover, vision educators need to understand the impact of these challenges on development, learning, communication, and personal safety.

- understand that there may be co-existing ocular conditions and that assessment and intervention for both conditions must be considered.

- understand that the unique visual behaviors seen in learners with CVI can impact development in all other areas which requires collaboration with other disciplines to fully understand the learner's complete profile.

- understand that CVI is an issue of visual recognition and interpretation whereby looking does not necessarily mean understanding.

- understand that CVI is a visual disability that is best supported through in-service training, direct services, and/or consultation depending on the assessed needs of each learner. However, in all situations, the responsibility of the vision educator extends to 1) the learner's accommodative needs across environments and throughout the day and 2) collaboration with others who interact with the learner.

- understand that intervention for CVI requires a three-pronged intervention approach: 1) deep assessment of the environments across the learner's day, 2) direct service for habilitation or rehabilitation, and 3) training of the team related to the habilitative supports and accommodative needs of the learner.

- make every effort to collaborate with all members of the learner's team including: family members, the medical community, the education team, and to enhance transdisciplinary assessment and services.

- be knowledgeable about the range of assessments for learners with CVI

- conduct assessments of learners with CVI (interviews, observations, and direct assessment) using a range of assessment tools and all available medical reports, educational reports, and parent information.

- develop intervention strategies matched to the assessed needs of the learner with CVI.

- suggest environmental adaptations as needed and daily programming needs for each learner in order to ensure optimal visual access.

- provide training to all members of the learner's team to increase understanding of the learner's visual support and accommodative needs as well as how visual skills impact function across all disciplines.

- continue to seek professional development related to brain-based visual impairments given the evolving research and information but not limited to just that related to vision. Vision educators need to understand other aspects of development (communication, motor, etc.), to enhance transdisciplinary assessment and service decisions for the whole learner.

- become informed consumers of research. This requires a basic working knowledge of the principles of scientific study design (i.e., hypothesis creation, randomization, control of variables, and replication in research). Vision educators should understand the terms *validity and reliability* in relation to assessments and interventions for CVI. They need to understand that correlation is not causation.

Assessment of Children with CVI by Teachers

The role and responsibility of the teacher of students with visual impairments is to lead the educational team by sharing essential information from specialized assessments, to assist in the development of the Individualized Family

Service Plan (IFSP) or Individualized Education Program (IEP). Teachers of students with visual impairments need to adopt assessment protocols to include a functional vision assessment, a learning media assessment, and an environmental assessment that examines the visual and behavioral characteristics that are indicative of CVI and to integrate these findings into the gestalt of the learner's educational needs. Collectively, these data provide the information that is needed for program planning, intervention, and service delivery.

The teacher of students with visual impairments must understand that traditional assessments are unlikely to adequately assess the unique aspects of functional vision that are indicative of CVI. Therefore, in conducting assessments when a child has CVI, the teacher of students with visual impairments must:

- include a review of ophthalmology and neurology reports with an understanding of the medical terms.
- understand that acuity measures are only part of the criteria for visual functioning in learners with CVI.
- partner with medical, educational, and related service professionals to determine if the ocular status of visual function explains the functional vision.
- understand how the learner with CVI is using compensatory skills (i.e., memory and motor-planning) or other non-visual strategies.
- lead the functional vision assessment and collaborate with primary team members. Such collaboration is essential to develop a full understanding of how the learner is functioning across environments and throughout the school day. Further, collaboration is important to ensure that assessments by other educational team members are appropriately adapted to meet the unique visual needs of the learner with CVI.
- complete and interpret all findings of the functional vision assessment and vision function assessment (i.e., as provided by an eye care professional).
- consider application of assessment findings within the framework of the Expanded Core Curriculum (ECC) in terms of the impact on the learner's functioning at all stages of development. This is especially important as the ECC is a unique expertise and responsibility of vision educators.

When conducting the functional vision assessment, the teacher of students with visual impairments must gather data from a variety of perspectives in order to fully understand the needs of the learner. Further, the teacher must understand the ocular conditions and conditions that may lead to a diagnosis of CVI. Valuable data points when completing the functional vision assessment include the following:

- review of the learner's medical (including neurological) and visual history
- direct interviews with the parents, teachers, therapists, and learner *(if applicable).*
- direct observations in the classroom, community, and natural environments

- direct assessment of the learner with examination of the unique visual behaviors exhibited by the learner that are specifically related to functional use of vision. The assessment may include, but is not limited to the following: sustained visual attention, color preference, lighting needs, contrast, difficulty with visual complexity, visual field preferences, facial discrimination, spatial dysfunction, motion perception, depth perception, appropriate symbol size, sensory-motor behaviors, and visual recognition. NOTE: This not a comprehensive list; consideration must be made given the unique needs of the learner.
- consideration of accommodative skills used by the learner to compensate for missing or distorted visual information (i.e., tactile investigation of objects, looking away while listening to sounds or touching objects, postural adjustments).
- consideration of behavioral responses to visual information (i.e., high anxiety, slow or uneven gait, closing eyes).
- assessment of the gestalt of the visual behaviors on the following: academic skills, pragmatics, mobility, activities of daily life, facial recognition, social interaction, personal safety, and vocational planning. This is a critical aspect of assessment.

The teacher of students with visual impairments must also complete a Learning Media Assessment (LMA) to evaluate the media needs (visual, tactile, and auditory) and sensory preferences of the learner. Information gleaned from the Functional Vision Assessment (FVA) should inform how the LMA is conducted. This assessment should be administered simultaneously each time an FVA is administered due to the fact that the primary learning media modality may change at different stages of development in learners with CVI.

The teacher of students with visual impairments, in consultation with an orientation and mobility specialist, must also complete an environmental assessment to evaluate the impact of the environment on the learner's visual performance. Information from the FVA and LMA will inform the environmental assessment and should be shared with the learner's educational team along with other assessment results. The purpose of the assessment is to determine possible environmental modifications to the surroundings and to the learning materials as well as those for orientation and mobility. For example, the environmental assessment must take into consideration the learner's experience related to sound, sight, and safety.

When learners with CVI have additional disabilities, the teacher of students with visual impairments and the educational team also should consider, at a minimum, the following when conducting a CVI assessment:
- use of familiar and unfamiliar items
- the learner's communication level and communication modes (linguistic and nonlinguistic) both receptively and expressively

- incorporation of sufficient wait time
- use of natural routines for observations
- proper physical positioning
- level of fatigue
- use of compensatory skills
- Note: These visual behaviors may be seen in learners with and without additional disabilities.

When learners with CVI do not have additional disabilities, the teacher of students with visual impairments and the educational team should consider the unique cluster of visual behaviors that could be present in functional vision.

- Ventral Stream Dysfunction – impairment in the ability to recognize objects, letters, or faces using visual information.
- Prosopagnosia – inability to recognize familiar faces and/or facial expressions.
- Simultanagnosia – inability to see two objects at once, thereby affecting shift of gaze.
- Topographic agnosia – inability to plan routes or retain route planning even in very familiar environments. This also impacts the ability to find objects or remember where they are stored.
- Auditory processing difficulties - difficulty in interpretation of auditory information similar to the impact of visual information when a learner has CVI.
- Note: These unique clusters of visual behaviors may be present in learners who have CVI with additional disabilities yet the clusters may be difficult to assess.

Educational Programming

In-service training, as well as Specially Designed Instruction and consultation services, must come from vision educators who have expertise and training specific to CVI in order to receive appropriate intervention. Although other professionals or the learner's parents may have knowledge and skills in CVI, vision educators must take the lead in assessment, intervention and service delivery (direct, coaching, consultative, and collaborative).

The vision educator is responsible for lesson planning, material development, and direct instruction of learners with CVI. In addition, it is considered most effective for the vision educator to reserve a portion of the day with the learner in the naturally scheduled routines of the learner's day. Being present in this way allows the vision educator the opportunity to train team members while simultaneously supporting the student's vision needs. During these sessions, the vision educator works toward desired outcomes across activities with

team members (i.e. classroom, lunch room). This model is effective when executed regularly during the course of the school year.

Consultation, coaching, and collaboration should include observation of the learner and the learner's team in their natural routine and environment with feedback to the learner's team. In addition, the vision educator should work with the team on the development and implementation of shared goals for the learner. The vision educator is responsible for looking at the learner's overall school day and working with the team to ensure that the learner has access to the curriculum throughout the day.

Assessment must be used to inform instruction and the individual learner's educational program. Vision educators must help the educational team recognize the urgency of providing Specially Designed Instruction in order to reach the desired outcomes as identified within IEP goals for learners with CVI. Such Specially Designed Instruction has a significant potential for improving the learner's functional use of vision. Vision educators must also use the assessment information in collaboration with school personnel to identify needed modifications and accommodations across activities, environments, and school personnel to ensure that access is provided throughout the school day.

Vision educators must provide information to the educational team regarding the challenges a learner with CVI has with ***access*** to the general education curriculum, specialized supports, and the ECC. For a learner with CVI, the vision educator must allot significant time to the initial planning phase of the learner's educational program, followed by continuous consultation and collaboration with the team.

The educational program must be developed from the assessment of the visual behaviors associated with CVI. The vision educator must work with team members to identify the specific accommodations (allowing access to grade level material), modifications (curriculum and testing are modified to the learner's level), and Specially Designed Instruction (adapting, as appropriate to the needs of an eligible learner, the content, methodology, or delivery of instruction) for the individual learner's educational program. Specially Designed Instruction must be individualized and based on assessment; they should not be broadly applied but based on the unique visual behavior of the individual learners and incorporated into a transdisciplinary model.

Collaboration

Collaboration and teaming are especially important when a learner has CVI. However, they can be challenging given the transitory nature of itinerant models of

service delivery. Therefore, teaming and collaboration must become an intentional goal for educational teams especially when learners have CVI.

Types of collaboration might include the following:

- Interdisciplinary teaming is most often seen when there is an overlap of disciplines like vision and reading, vision and physical education, or vision and technology to give just a few examples. This type of teaming might be used when the vision specialist visits the school and meets one-to-one with a specific specialist to make verbal suggestions or for specific questions and concerns.

- Multidisciplinary teaming is most often the means for collaboration. In this model many disciplines investigate a single problem or topic so that a topic can be discussed, understood and planned from multiple perspectives.

- Transdisciplinary teaming is very different from the other two types. With this type of teaming, the boundaries between disciplines become blurred and, in some cases, no longer exist. Every team member brings their own training and expertise to the team and shares this knowledge so that aspects of each can be implemented into each activity to fully engage the learner. In many situations, the IEP reflects this teaming with the goals and benchmarks written in such a manner to reflect the tight collaboration between disciplines.

Collaboration with the Educational Team: When learners have CVI, there is a need for team members to share knowledge and discipline responsibilities. Consistency between team members in the way that supports are used will help learners to be fully engaged. Further, these accommodations must span the learner's day across all routines. With various team members in contact with the learner throughout the day, shared knowledge and collaboration will increase consistency. In addition, sharing between team members about the learner's progress over time will help the team monitor the need for changes to accommodations and supports. However, perhaps the most beneficial outcome of shared knowledge and collaboration is the awareness of the needs of the whole learner as perceived by the collective perspective. Such collaboration often generates the most appropriate accommodation to meet the learner's needs.

Collaboration with Medical Personnel: Collaboration with medical personnel is essential. Information should be shared to cultivate a cohesive understanding of the learner's needs. However, sharing information with medical professionals can present its own challenges. Further, CVI is not always easily or fully assessed in a clinical setting. Therefore, vision educators can provide critical information about functional and associated challenges across the learner's day and across environments. Given time constraints of medical personnel, consideration must be made for the means of communication used and the amount of information shared. For example, phone calls and abbreviated reports may be preferred. However, development of a relationship with local medical professionals is key. This

typically and intentionally is cultivated over time. Knowledge about CVI among medical personnel can vary greatly and, as a result, sometimes it becomes the responsibility of the vision educator to provide medical personnel with access to information about CVI. At times the information shared by the vision educator can help to clarify or change the diagnosis just as the information from the medical personnel may clarify or change educational planning.

Successful collaboration that includes all team members requires:

- Both regularly scheduled team progress meetings and regularly scheduled working meetings. This is very beneficial for complex learners such as those with CVI. The latter is for team members to accomplish detailed planning and revisions as needed to ensure that each activity of the learner's school day embeds as many goals and objectives from the varying disciplines as possible. This is transdisciplinary implementation. In essence, it is a type of lesson planning. Ideally, the paraprofessional should attend many of these meetings to better insure carry-through as needed so that teams can work successfully.
- Time is needed at the very beginning of the school year to plan both the progress meetings and the working meetings.
- Administrative support for an agreed upon collaboration model is needed. Such support can facilitate the hiring of consultants and substitutes as needed as well as support adjustments in travel, schedules, and caseload.

Conclusion

It is our position that the complex needs of learners who have CVI requires specialized responses to educational teams including families. Thus, the purpose of this paper was 1) to acknowledge the foundational work that has been done, 2) to identify recommended practices based on research and current knowledge, and 3) to spur collaboration and agreement among all members of the educational team. Learners included those with and without additional disabilities as well as those with co-existing ocular conditions. Discussion areas included the following:

- The role of the vision educator (i.e., teachers of students with visual impairments and orientation and mobility specialists), along with the qualifications of the vision educator, was also discussed. Instructional leadership of the vision educator included one-to-one instruction, modeling and feedback to classroom personnel, the development of curricula and materials, data collection and analysis, co-teaching with other professionals and peer support. In addition, the vision educator is responsible for looking at the learner's overall school day and working with the team to ensure that the learner has access to both the general curriculum and the ECC throughout the day. Finally, the leadership of the vision educator also includes collaborating with parents and family members in methods of implementing appropriate CVI interventions in the home.

- Assessment of learners encompasses a functional vision assessment, learning media assessment, and environmental assessment that examines the visual and behavioral characteristics that are indicative of CVI and to integrate these findings into the gestalt of the learner's educational needs. Such assessment results provide a comprehensive evaluation especially when combined with assessments of other skill areas (i.e., sensory-motor, communication, etc.) and disciplines. The recommended basic knowledge and functions of teachers of students with visual impairments to provide quality assessments was provided.

- Suggested educational programming included service delivery in the forms of direct instruction to the learner encompassing lesson planning, material development, and direct instruction of the learner. Coaching, consultation, and collaboration services were discussed and a suggested model was described. Development and implementation of shared goals for the learner was highlighted. Such shared goals ensure that learners will have access to both the general curriculum and the expanded core curriculum.

- The discussion of collaboration with both educational and medical personnel recognized challenges facing itinerant vision educators with the suggestion that such collaboration must become an intentional goal for educational teams especially when learners have CVI. Different types of collaboration were outlined with a recommendation for the use of transdisciplinary models that prioritize shared knowledge and responsibility among team members. This model is preferred given the unique and complex needs of learners who have CVI.

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