

North Carolina Guidance Document for Students who have a Neurological Visual Impairment

Introduction

Under the IDEA eligibility category Visual Impairment, including blindness, students either have an ocular impairment, a neurological visual impairment, an ocular motor visual impairment, or any combination of the three¹. An ocular visual impairment involves the eye, optic nerve, and optic chiasm. A neurological visual impairment includes students who have the diagnosis of Cortical/Cerebral Visual Impairment (CVI) and involves damage to the visual pathways, or centers of the brain, which process visual information. An ocular motor visual impairment involves fixation and tracking difficulties, eye misalignment, and accommodation difficulties.

CVI is the leading cause of pediatric visual impairment^{2,3,4}. The term cortical has historically been used in the United States, while elsewhere in the world the term cerebral is applied⁵. Specifically, the use of the term cerebral is broader and encompasses greater deficit regions of the brain and the term cortical is seen as a subset of the aforementioned⁶. While terminology can sometimes be confusing as to whether a pediatric neurological visual impairment diagnosis is referred to as cortical or cerebral, it can be agreed upon that:

- [1] the diagnosis is a brain-based, non-ocular, visual impairment (because over 40% of the brain is involved with processing visual input) and,
- [2] the potential effects of CVI to functional vision are wide-ranging and can vary from mild to severe.

The neurological visual impairment terms cortical and cerebral have also been applied to assessment and instructional approaches with specific strategies, which may lead to confusion. These various approaches to neurological visual impairment analyze different sets of abilities, skills, and behaviors unique to children with CVI. While the medical community wrestles with terminology⁷, M.S. Ely (2016)⁸ suggests that educators avoid getting caught up in this struggle and focus on the immediate and more pressing needs of the students and their families.

Publications regarding assessment and intervention planning for students with CVI is relatively new, within the past 10-15 years^{9,10,11}; yet, educational research documenting the unique characteristics of these students goes back to the 1990s^{12,13}. As research continues, the knowledge of working with this group of students is ever growing. As a result, it is essential that Teachers of the Visually Impaired continually access professional development opportunities focused on neurological visual impairment. Valuable published resources available to professionals on the topic of neurological visual impairment include, *Vision and the Brain: Understanding Cerebral Visual Impairment in Children* and *Cortical Visual Impairment: An Approach to Assessment and Intervention* (2nd ed.). More resources are included in the Resources section at the end of the document.

Teachers of the Visually Impaired not only serve the unique needs of students who have traditional ocular visual impairments, but also students who have a neurological visual impairment. Within their preservice programs, Teachers of the Visually Impaired are trained to address the unique needs of students who experience adverse effects to their educational performance as a result of ocular and/or neurological vision loss.

Evaluation

In adherence to IDEA, when an evaluation is conducted the public agency must, “*use a variety of assessment tools and strategies to gather relevant functional, developmental, and academic information about the child...*”¹⁴. In addition, the evaluation process should not be limited to *any single measure or assessment as the sole criterion for determining whether a child is a child with a disability and for determining an appropriate educational program for the child.*

Different tools exist to evaluate the effects of neurological visual impairment in children. One of the first such tools available to educators was the *CVI Range*. This tool gathers a snapshot of information about the student's current level of visual functioning and determines the extent to which CVI impacts the use of vision, using a continuum that ranges from 1-10, spanning three (3) phases. Since the CVI Range was first introduced, other methods have been developed to evaluate a variety of behaviors associated with CVI. Multidisciplinary assessments are recommended for children with neurological visual impairment due to the complex nature of the condition that affects not only the visual world, but other learning and developmental domains. It should be noted that regardless of the specific CVI evaluation instruments and intervention approaches used, assessment of students with CVI should be completed in conjunction with standard visual impairment assessments including Functional Vision and Learning Media Assessments, in order to meet all the requirements for eligibility or reevaluation set forth by IDEA and North Carolina *Policies Governing Services for Children With Disabilities*¹⁵. A variety of assessment and screening tools representing both cortical and cerebral visual impairment are indicated in the Resources section at the end of this document.

The functional vision assessment (FVA) does not refer to any specific diagnostic tool or instrument, but rather to an evaluation process, which includes, but is not limited to, observations across settings and interviews with family and educational team members. Its purpose is to measure the extent to which the visual impairment adversely impacts student learning¹⁶. When completing an FVA for a child with a neurological visual impairment, it is important to collect comprehensive information on the student's ability to use vision throughout a variety of settings. Because it's not uncommon for a student with a neurological visual impairment to also have an ocular disorder (including but not limited to ocular motor), a comprehensive FVA should evaluate developmental (i.e., perceptual), ocular (i.e., visual field, acuities), and neurological (i.e., responses related to movement, familiarity, complexity) domains¹⁷. Since few assessment tools cover all three visual functioning components, various protocols are utilized during this evaluation¹⁸.

The learning media assessment (LMA) is also an evaluation process used to not only identify general learning media, but also identify sensory preferences used throughout a variety of environments. When completing an LMA for a student with a neurological visual impairment, it is important to collect not only traditional information gathered during the process (e.g., postural observation, preferred sensory channels, overall reading readiness), but additional information that is unique to the specific CVI diagnosis that may affect a student's optimal learning media (i.e., crowding effect on symbols/pictures, ability to see row/column alignment, ability to recognize letters/numbers, position of material, and preferred angles of reading)¹⁹. For example, a six-year longitudinal study of four students with CVI resulted in two students reading print, one student utilizing a combination of braille and print, and one student preferring to solely use braille²⁰. Therefore, the IEP Team must carefully examine the data gathered from all assessments to determine the most appropriate goals for the student.

Requirements set by IDEA also indicates that professionals conducting the assessments should be “*trained and knowledgeable*”²¹. Currently, professionals have access to a variety of materials and

specialized training opportunities pertaining to working with students who have the diagnosis CVI. Some of these resources are included in the Resources section. Through university teacher preparation programs within the United States, neurological visual impairment content is covered within coursework. While each university is unique in their programming²², professional standards guide content²³. Several of these professional standards outline knowledge and skills in progress monitoring of student's academic and functional goals as this is an essential component of educational programming. As such, preservice programs in low vision and blindness prioritize building candidate knowledge and skills in this area. However, these professional standards do not identify the teaching of specific assessment tools. This is because individualization is necessary for assessment just as it is in instruction. For example, the *CVI Range* (Roman) and various tools provided in *Assessments of Children with CVI* (Lueck & Dutton) are all available resources for teachers when meeting the wide range of student needs. Therefore, teacher candidates must be familiar with a variety of assessment tools and approaches to meet student needs. This is increasingly important as understanding about CVI is still growing through research.

Eligibility

IDEA defines the eligibility category of Visual Impairment, including blindness, "*an impairment in vision that, even with correction, adversely affects a child's educational performance. The term includes both partial sight and blindness*"²⁴. To be determined eligible within this category in North Carolina for special education and related services, the disability must also have an adverse effect on educational performance and require specially designed instruction (SDI), as documented through the evaluation process²⁵. Regardless of the area of eligibility on an IEP, students with the diagnosis of Cortical/Cerebral Visual Impairment have been served and continue to be served by Teachers of the Visually Impaired. These students historically have been included on the national Legally Blind Registration and the Deaf-Blind Census. In 2017, North Carolina had 859 students who met the neurological eligibility requirement and were included on the Legally Blind Registration, which is commensurate with published literature about CVI. In addition, 138 students with a neurological visual impairment were included in the 2016 North Carolina Deafblind Census. Of the aforementioned students from both data collection sources, 78 students were eligible as Legally Blind and Deafblind.

IEP Team Collaboration for Students with a Neurological Visual Impairment

When an IEP Team convenes, each individual combines his/her knowledge, experience, and commitment to meet the student's unique needs when writing an effective Individualized Education Program (IEP). According to IDEA, the IEP Team should include the following members: parent(s) of the student or someone granted to serve in that capacity; not less than one regular education teacher of the student (if the student is, or may be, participating in the regular education environment); not less than one special education teacher of the student; a representative of the local educational agency; an individual who can interpret instructional implications of evaluation results; other individuals who have knowledge or special expertise regarding the student; and the student (when appropriate)²⁶. No one team member is more important than another; rather, their equal collaborative effort gives strength to decision making and instructional planning.

Intervention, Specially Designed Instruction, and Progress Monitoring

After the assessments are completed and the student is determined eligible to receive special education and related services, the IEP Team then uses the assessment data to develop SDI. It is important for the team to know, that regardless of the approach (cortical or cerebral) used to assess visual functioning, instruction varies from child to child based on capabilities and task demands. The assessment data also

assists the IEP Team in developing a plan that incorporates possible modifications, supplemental aids, and supports into SDI and daily routines.

Specifically, the Teacher of the Visually Impaired should provide the following assistance to the IEP Team for all students with visual impairment²⁷:

- 1) In-service the educational team on the student's visual needs
- 2) Identify and make accommodations to both the physical environment and instructional approach
- 3) Work directly with the student to capitalize on visual function

As defined by IDEA, SDI means "*adapting... the content, methodology, or delivery of instruction, in order to meet the unique needs of the child that result from the child's disability and to ensure access of the child to the general curriculum...*"²⁸. As with any student with a disability, educational interventions should be implemented during instruction and always be linked to assessment results. Whether the student is gaining access to the General Curriculum or the Extended Content Standards, as well as the Expanded Core Curriculum for students with visual impairment, instruction and oftentimes the environment need to be modified in response to the effects of a neurological visual impairment. For example, the student's unique needs may be addressed using an *IFSP Intervention Planning Worksheet and Schedule* also referred to as *Intervention Planning Worksheet* (Roman) or by completing the *Areas of Functional Vision Important for the Performance of Daily Activities* (Dutton). IEP teams should remain mindful that various tools are available and should be chosen based on specific student and instructional needs.

Progress monitoring of academic and functional goals is an essential component of a student's educational program. It is part of the IEP process and is the method by which educators assess the progress of individual goals and effectiveness of instruction over time. While examples of the *CVI Range* (Roman) and tools provided in *Assessments of Children with CVI* (Lueck & Dutton) may be used during the evaluation process, these tools may also be utilized for purposes of progress monitoring annual goals and informing instruction. In addition, progress monitoring of IEP goals can be individualized with benchmark objectives in order to collect data in smaller increments.

Resources	
Cerebral	Cortical
<p>Lueck, A. H., & Dutton, G. (2015). <i>Vision and the brain: Understanding cerebral visual impairment in children</i>. New York: AFB Press.</p> <ul style="list-style-type: none"> ○ Questions to Ask Parent and Caregivers of Children with CVI, Figure 11.2 (p.270-274) ○ Observational Assessment of Functional Vision, Figure 10.2 (p. 228-229) ○ Recording Form for Observed Behaviors for Young Children and Children with Visual and Cognitive Challenges, Figure 10.3 (p.232) ○ Summary of Evaluation for Dorsal Stream Disorders, Figure 10.6 (p. 236) ○ Summary of Evaluation for Ventral Stream Disorders, Figure 10.7 (p.237) ○ Assessment of Areas of Functional Vision Important for the Performance of Daily Activities, Figure 14.5 (p.406-408) ○ O&M Observation Protocol for Students with CVI, Sidebar 17.1 (p.456-457) ○ Tree of Vision: The Principal Functions of the Visual System and How They Are Connected, Figure 3.6 (p. 74) ○ Determination of Literacy and Learning Media for Children with CVI, Sidebar 15.1 (p. 416-417) 	<p>Roman-Lantzy, C. (2018). <i>Cortical visual impairment: An approach to assessment and intervention</i>. New York: AFB Press.</p> <ul style="list-style-type: none"> ○ CVI Parent Interview, Sidebar 4.1 (p. 56) ○ CVI Range: Cover Sheet and Across CVI Characteristics Assessment Method (Rating I) Form, Figure 5.1 (p.96-99) ○ CVI Range: Within-CVI Characteristics Assessment Method (Rating II) Form, Figure 5.3 (p. 104) ○ CVI Range Assessment Review, Figure 5.5 (p. 6107-109) ○ CVI Range: Phase III Extension Chart, Figure 5.5 (p. 110-113) ○ CVI Progress Chart, Figure 5.6 (p. 116-118) ○ Sample Completed IFSP/IEP Intervention Planning Worksheet and Schedule, Figure 6.4 (p.196-199) ○ CVI Range Review Form for Students in Phase I and Phase II CVI, Figure 6.5 (p. 217-219) ○ CVI Orientation and Mobility Resolution Chart, Figure 6.6 (p. 221-223)
<p>Philip, S.S. & Dutton, G.N. (2014). Identifying and characterising cerebral visual impairment in children: A review. <i>Clinical and Experimental Optometry</i>. May, (196-208).</p> <ul style="list-style-type: none"> ○ A Selection of the Many Approaches that Parents and Teachers have Successfully Applied for Children with Cerebral Visual Impairment 	<p>Roman-Lantzy, C. A., & Lantzy, A. (2010). Outcomes and opportunities: A study of children with cortical visual impairment. <i>Journal of Visual Impairment & Blindness</i>, 104(10), 649-653.</p>
<p>Ek, U., Fellaniusm K., Jacobson, L. (2003). Reading acquisition, cognitive and visual development, and self-esteem in four children with cerebral visual impairment; <i>Journal of Visual Impairment and Blindness</i>, 97, 741-754.</p>	<p>Newcomb, S. (2010). The reliability of the CVI Range: A functional vision assessment for children with cortical visual impairment. <i>Journal of Visual Impairment & Blindness</i>, 104(10), 637-647.</p>
<p>http://cviscotland.org/</p> <ul style="list-style-type: none"> ○ LOOK: A Free Reading Tool ○ Gordon Dutton's blog 	
<p>https://www.teachcvi.net/</p> <ul style="list-style-type: none"> ○ Vision Assessment in Children ○ Neuropsychological Assessment ○ Visual Functions and Functional Vision Assessment 	
Additional Information	
CVI: The Conversation Continues, http://tech.aph.org/cvi/	
<p>Jan, J., Heaven, R.K.B., Matsuba, C., Langley, M.B., Roman-Lantzy, C., Anthony, T.L. (2013). Windows into the visual brain: New discoveries about the visual system, its functions, and I implications for practitioners. <i>Journal of Visual Impairment & Blindness</i>, 107, 251-261.</p>	
Training for CVI	
http://www.perkinselearning.org/videos/webinar/cvi	

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