

**Position Paper on Clinical Low Vision Evaluation and Treatment  
of Students with Visual Impairments  
for Parents, Educators and Other Professionals**

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## **Introduction**

Periodic comprehensive clinical low vision evaluations by optometrists or ophthalmologists trained and experienced in low vision rehabilitation are essential to maximize the functional abilities of students with visual impairments and to facilitate their success in the classroom and in the community. Information from these clinical low vision evaluations is essential for the development of Early Intervention Programs (EIPs) as well as Individualized Educational Programs (IEPs) or Section 504 Accommodation Plans.

## **What is low vision?**

The National Eye Institute<sup>1</sup> defines low vision as a bilateral visual impairment that is not correctable by standard glasses, contact lenses, medicine, or surgery, and that interferes with the person's ability to perform everyday activities. Similarly, under the Individuals with Disability in Education Act (IDEA) Section 300.8(13), visual impairment means an impairment in vision (after best-correction with glasses or contact lenses) that adversely affects a child's educational performance.<sup>2</sup> Eye conditions that result in childhood visual impairment include congenitally acquired conditions, such as albinism, achromatopsia, aniridia, congenital glaucoma, congenital cataracts, Leber's congenital amaurosis, nystagmus, optic nerve hypoplasia, and retinopathy of prematurity, as well as conditions that develop after birth such as cone-rod dystrophy, dominant optic atrophy, retinitis pigmentosa, Stargardt disease, and many other less common conditions, including genetic and developmental syndromes. Childhood visual impairment may also be due to congenital or acquired neurological conditions that affect areas in the brain that process vision (sometimes referred to as cortical visual impairment or cerebral visual impairment).

## **What is the prevalence of low vision in the pediatric population?**

It is estimated that 0.2% of school-age children in the United States are visually impaired,<sup>3</sup> with approximately 16% of these children considered functionally or totally blind.<sup>4,5</sup> However, the true prevalence of childhood visual impairment and blindness in the United States is unknown, as there

have been no population-based studies and there is no national reporting system. Generally, to qualify for special education services because of a visual impairment, the student's best-corrected visual acuity has to be 20/70 or worse in the better eye. Additional criteria such as limitations in peripheral vision, as well as the expectation for progressive vision loss, are also considered.

### **How is low vision rehabilitation regarded by eye health organizations?**

The American Optometric Association's Clinical Practice Guidelines,<sup>6</sup> the National Eye Institute's National Eye Health Education Program,<sup>7</sup> and the American Academy of Ophthalmology's Preferred Practice Pattern for Vision Rehabilitation<sup>8</sup> recognize the importance of low vision rehabilitation in the treatment and management of children with visual impairments. These organizations acknowledge that low vision rehabilitation/habilitation is the main treatment modality for permanent visual impairment and is the primary strategy to prevent a visual impairment from becoming a disability or a handicap.

### **What is a clinical low vision evaluation?**

A clinical low vision evaluation is a specialized eye examination that focuses on visual function as well as prescription of adaptive equipment to maximize the use of the child's limited vision. An optometrist or ophthalmologist trained and experienced in low vision rehabilitation uses a variety of standard and modified testing techniques to obtain information about the student's visual condition including, but not limited to, best-corrected distance and near visual acuity, central and peripheral field of vision, focusing ability, range of eye movements, eye alignment, depth perception, color vision, ability to see low contrast objects, and ability to function under different levels of illumination. When indicated, the doctor will prescribe corrective lenses and adaptive devices that enable the student to use residual vision more effectively and efficiently for learning, as well as for everyday activities. A report that includes recommendations for optimum print size and contrast of educational materials, lighting and glare reduction strategies, magnification needs (including adaptive devices and technology), viewing strategies to reduce the effects of central blind spots (if present), as well as contrast

enhancement strategies for both reading and writing activities, is provided. Recommendations are also made regarding field of vision and acuity-related classroom seating, placement of educational materials to enhance the use of residual field and reduce nystagmus (if present), as well as other classroom environmental modifications to enhance the use of the student's available vision for learning. For students who experience discomfort from indoor or outdoor glare, recommendations are made for specialty lens tints and glare-reducing coatings for their spectacles to increase visual comfort under a wide range of lighting conditions.

**At what age should a child with a visual impairment have a comprehensive clinical low vision evaluation?**

Comprehensive clinical low vision care should begin as soon as a visual impairment has been identified, regardless of a child's age or presence of any additional physical or developmental disabilities. The incorporation of an individualized rehabilitation/habilitation plan into an Early Intervention Program can provide children with better access to their visual environment, minimize the impact of visual impairment on everyday activities, and smooth the transition to school. Ongoing clinical low vision care, throughout the preschool/K-12 educational program, is imperative because children's visual needs change as they advance through their educational years and into adulthood. Clinical low vision evaluations are especially important at transition times, such as when entering primary and secondary school programs, or when students are preparing to enter college or a vocational training program.

**What other services should a child with a visual impairment receive?**

All assessments for determining a student's learning media should include the results of a Functional Vision Assessment (FVA) performed by a Teacher of Students with Visual Impairment (TVI). A Certified Orientation and Mobility Specialist (COMS) should determine if the child's visual impairment is adversely affecting his or her ability to negotiate stairs, curbs, and other mobility related obstacles in a safe and efficient manner.

Additionally, students with visual impairments may benefit from an assistive technology evaluation, as well as other services to be determined by the educational team, parents, and, when appropriate, the student. Finally, all students, regardless of their visual status, should have ongoing eye health evaluations at the frequency recommended by their optometrist or ophthalmologist.

### **How do students with visual impairments become literate?**

Achieving literacy is of critical importance in the education of all students. Reading is a vital skill in the educational process. Access to reading materials may be achieved through regular print, large print, auditory means (e.g., text to speech technology), or Braille. Some students will use more than one of these formats for reading.

### **What types of devices might a student with a visual impairment use for literacy?**

Optical and electronic magnification devices often play an important role in enabling the successful development and maintenance of literacy for students with a visual impairment. While many devices are available without prescription, performance with the device is optimal when the device is individualized for the unique needs and characteristics of each student. When prescribing these devices, an optometrist or ophthalmologist trained and experienced in low vision rehabilitation considers the student's goals, characteristics of the student's underlying disease or disorder, and specific test results, including the student's visual acuity, refractive error, focusing ability, contrast sensitivity, binocularity, visual field, working distance, and lighting needs. The prescribed device incorporates the necessary corrective lenses and magnification power that enables the student to read educational text.

In order to read with comfort and efficiency, multiple studies have shown that individuals with vision impairment require greater magnification than is required to just discern their print size goal.<sup>9-13</sup> The difference between a student's smallest identifiable threshold print size and the print size that provides the student with comfortable and efficient reading is known as the reading reserve. Sufficient magnification is prescribed during a low vision evaluation to ensure an adequate reading reserve,

resulting in faster and more efficient reading. The amount of reading reserve required for best performance varies from student to student, even when they have similar eye conditions. It is therefore imperative that the device magnification power be optimized for each student. The low vision clinician uses objective data to make these recommendations.

### **What other options are available for a student with a visual impairment to use for reading?**

Advances in technology, including electronic magnification, electronic books, and text-to-speech devices, have made print more accessible than ever before to individuals who are blind and visually impaired. Nevertheless, Braille continues to have an important role for students without functional vision and those who access information more efficiently using tactile strategies. Most people with visual impairments, however, can read print visually, using one or more approaches, including a closer viewing distance alone, or with the use of additional magnification of print provided by optical or electronic magnification devices. These strategies facilitate the effective use of residual vision in achieving literacy.<sup>14, 15</sup>

An additional option for reading print is the use of hard copy print enlargement. Exclusive reliance on hardcopy large print, however, has been shown to result in slowed reading speeds and the inability to read when away from school, unlike the results for students using optical or electronic devices.<sup>16, 17</sup>

Optical and/or electronic magnification devices provide students not only with immediate access to printed material at their desks, but some devices allow access to educational information at extended distances, such as on traditional or interactive white boards. Once the best corrective lenses have been provided for distance viewing, other options such as telescopes should be considered for improvement of detail vision at distances beyond arm's length, such as reading the board in school and street signs in the community.

Magnification devices for viewing at distance and at near increase a student's options for reading and for a range of other activities, resulting in increased access to information and greater

visual independence.

### **What is the least restrictive educational environment?**

The Individuals with Disabilities Educational Act states that all students are entitled to a free, appropriate public education in the least restrictive environment. Often, the use of low vision devices, prescribed by an optometrist or ophthalmologist trained and experienced in low vision rehabilitation, constitutes the least restrictive approach to allowing access to printed materials.<sup>18</sup>

### **Summary**

It is essential that children with visual impairments have access to ongoing clinical low vision care. Ongoing clinical low vision evaluations, performed by optometrists or ophthalmologists trained and experienced in low vision rehabilitation, provide all adults involved in the care, education, and habilitation/rehabilitation of children with visual impairments with critical information about the nature and severity of a child's visual impairment and strategies for enhancing the child's use of remaining vision. These strategies include corrective lenses, magnification and other low vision adaptive devices, as well as services and accommodations that would increase the child's access to visual information at school and during activities of daily living. Students with visual impairments should have access to prescribed optical and/or electronic adaptive devices, instruction in the use of prescribed devices, and recommended habilitation/rehabilitation services throughout their educational program. Information provided by ongoing clinical low vision evaluations ensures that Early Intervention Programs for young children and Individualized Educational Programs for school-age children are truly individualized for the visual needs of children with visual impairments and provides these children with the best opportunity for successful growth and development.

**NOTICE:** This report is furnished for general information purposes only. It does not constitute the practice of optometry or medicine, nor should it be relied upon for dealing with a specific, individual

medical or health condition. Please consult a qualified eye care professional for advice about a specific condition.

## References

1. National Eye Institute's Definition of Low Vision. Available at:  
<http://www.nei.nih.gov/lowvision/content/glossary.asp>. Accessed July 18, 2013.
2. Individuals with Disability in Education Act (IDEA). Available at:  
<http://idea.ed.gov/explore/view/p/,root,regs,300,A,300%252E8>. Accessed March 9, 2014.
3. Nelson KA, Dimitrova E. Severe visual impairment in the United States and in each state, 1990. *J Vis Impair Blind* 1993;87:80-5.
4. Wilkinson, ME & Trantham, CS. Characteristics of children evaluated at a pediatric low vision clinic: 1981-2003, *J Vis Impair Blind* 2004;98(11):693-702.
5. DeCarlo, DK & Nowakowski R. Causes of visual impairment among students at the Alabama School for the Blind. *J Am Optom Assoc* 1999;70:647-52.
6. Optometric Clinical Practice Guideline: Care of the Patient with Visual Impairment (Low Vision Rehabilitation). St. Louis: American Optometric Association, 2007.
7. National Eye Health Education Program, Low Vision Public Education Plan, April 1999. Available at: <http://www.nei.nih.gov/nehep/programs/lowvision/index.asp>. Accessed March 18, 2013.
8. American Academy of Ophthalmology Vision Rehabilitation Committee. Preferred Practice Pattern® Guidelines. Vision Rehabilitation. San Francisco, CA: American Academy of Ophthalmology; 2013. Available at [www.aao.org/ppp](http://www.aao.org/ppp).
9. Lovie-Kitchin JE, Bevan JD & Hein B. Reading performance in children with low vision. *Clin Exp Optom* 2001;84(3):148-54.

10. Whittaker SG & Lovie-Kitchin JE. Visual requirements for reading. *Optom Vis Sci* 1993;70(1):54-65.
11. Cheong AM, Lovie-Kitchin JE & Bowers AR. Determining magnification for reading with low vision. *Clin Exp Optom* 2002;85(4):229-37.
12. Lovie-Kitchin JE. Reading with low vision: the impact of research on clinical management. *Clin Exp Optom* 2011;94(2):121-32.
13. Latham K & Tabrett DR. Guidelines for predicting performance with low vision aids. *Optom Vis Sci* 2012;89(9):1316-26.
14. D'Andrea FM & Farrenkopf C. Introduction: Paths to literacy. In: D'Andrea FM, Farrenkopf, C, eds. *Looking to Learn: Promoting Literacy for Students With Low Vision*. New York: AFB Press; 2000:1-9.
15. Holbrook MC, Koenig AJ & Rex EJ. Instruction of literacy skills to children and youths with low vision. In: Corn AL, Erin JN, eds. *Foundations of Low Vision, Clinical and Functional Perspectives*. 2nd ed.. New York: AFB Press; 2010:484-526.
16. Farmer, J. & Morse, SE. Project magnify: Increasing reading skills in students with low vision. *J Vis Impair Blind* 2007;101:763-8.
17. Corn, AL, Wall, RS, Jose, R, Bell, J, Wilcox, K, & Perez, A. An initial study of reading and comprehension rates for students receiving optical devices. *J Vis Impair Blind* 2002;96:322-34.
18. Corn, AL & Ryser, GR. Access to print for students with low vision. *J Vis Impair Blind* 1989;83(7):340-9.

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