

## AOA Evidence-Based Clinical Practice Guidelines: Comprehensive Pediatric Eye and Vision Examination 2017 – Clinical Pearls

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- In addition to the current costs of care, future costs for undiagnosed and untreated vision problems may include the loss of a child's full potential, and limitations on his or her occupational choices and future earnings.
- Eye and vision disorders can lead to problems in a child's school performance, interactions, and self-esteem.
- Vision disorders that occur in childhood may manifest as problems well into adulthood, affecting an individual's level of education, employment opportunities, and social interactions.
- Children with developmental and intellectual disabilities are reported to have significantly more eye and vision problems (e.g., strabismus, refractive errors, and nystagmus) than children without these disabilities. The increasing severity of the disability may be related to a higher prevalence of vision problems.
- **Convergence insufficiency (CI)** is a binocular vision disorder that affects up to **8.3%** of school-age children and is associated with symptoms such as eyestrain, headaches, blurred vision, diplopia, sleepiness, difficulty concentrating, movement of print while reading, loss of place, and loss of comprehension after short periods of reading.
- The Convergence Insufficiency and Reading Study Group investigators found that **13% of fifth and sixth grade children** (definite and high suspect) had clinically significant CI (insufficient fusional convergence, receded nearpoint of convergence, and/or exophoria at near  $\geq 4$  prism diopters at far).
- **Convergence excess (CE) has been reported to occur in 7.1%** of children in one clinical pediatric population. It may be due to a high accommodative convergence/accommodation (AC/A) ratio. Symptoms can include blurred vision, diplopia, headaches, and difficulty concentrating on near tasks.
- **Children born prematurely** are at risk for the development of severe visual impairment and blindness. Preterm infants have higher rates of amblyopia, strabismus, optic atrophy, and refractive errors.
- **Vision problems such as accommodative, binocular vision, eye movement, and visual information processing disorders can interfere with academic performance.**
- When a child's history or initial testing indicates a possible developmental lag or learning disorder, additional testing should be performed to rule out a learning-related vision disorder.
- This will typically require an additional office visit that includes more extensive testing of accommodation, binocular vision, and eye movements, and an assessment of visual information processing skills. **In some instances, this may require a referral to a doctor of optometry with advanced training in this area of practice.**

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- Many children with special needs have undetected and untreated visual problems. Children with developmental or intellectual disabilities have a higher rate of vision disorders and should receive a comprehensive pediatric eye and vision examination.

Although clinically more challenging, visual assessment is possible in the majority of these children. Early identification of specific visual deficits could lead to interventions to improve the educational and occupational achievement and quality of life for these high-risk children.

- In addition to its relationship to the development of strabismus and amblyopia, hyperopia can also affect the development of literacy skills. **Correction of hyperopia may, under specific conditions, lead to increased reading speed; therefore, eye examinations to diagnose uncorrected hyperopia are recommended.**
- **An accommodative or vergence dysfunction can have a negative effect on a child's school performance, especially after third grade when the child must read smaller print and reading demands increase.** Children with convergence insufficiency self-report more problems compared to children with normal binocular vision. These include somatic (e.g., eyes hurt or headaches), visual (e.g., blur and diplopia), and performance (e.g., loss of concentration, frequent need to re-read and difficulty remembering what is read) problems. **Due to the discomfort of these symptoms, a child may not be able to complete reading or homework assignments and may be easily distracted or inattentive.**
- Children with **Attention Deficit/Hyperactivity Disorder (AD/HD)** have been reported to have a much greater incidence of CI than those without AD/HD; these children may benefit from comprehensive vision evaluation to assess the presence of convergence insufficiency. Treatment of convergence insufficiency has been associated with reduction in the frequency of adverse academic behaviors.
- **A majority of concussions** occur in the pediatric and adolescent population (5 to 17 years of age), with the 11 to 17-year-old group representing the largest proportion of those injured. Children are particularly vulnerable to the consequences of concussion, often having a more prolonged recovery and poorer outcomes, from a cognitive and developmental perspective, than adults with concussion.
- A recent study found a **high prevalence of vision problems in adolescents with concussion** along with significant symptoms associated with these vision disorders. The most common binocular vision disorder occurring in post-concussion syndrome is convergence insufficiency (CI) with a prevalence of 49% in children. Other common problems are accommodative insufficiency and saccadic dysfunction.