

Convergence Insufficiency (CI) Fact Sheet

This convergence insufficiency (CI) fact sheet was developed to provide additional information about CI. The information will assist educational professionals with understanding what CI is, how it is diagnosed, and how it should be treated. Readers will find information about what can be done to support a child within the educational environment if limitations directly related to CI persistently impact academic performance.

What is CI?

“Convergence insufficiency (CI) is a common binocular vision disorder that is often associated with a variety of symptoms, including eyestrain, headaches, blurred vision, diplopia [double vision], sleepiness, difficulty concentrating, movement of print while reading and loss of comprehension after short periods of reading or performing close activities.” (Pennsylvania College of Optometry, 2008).

Convergence insufficiency (CI) is an eye-teaming problem in which the eyes have a strong tendency to drift outward when reading or doing close work. If the eyes do drift out, the person is likely to have double vision. To prevent double vision, the individual exerts extra effort to make the eyes turn back in (converge). This extra effort can lead to symptoms that interfere with the length of time and comfort in reading and working on close tasks.

What are the Symptoms of Convergence Insufficiency?

A person who has convergence insufficiency may show and/or complain of the following while doing close work (i.e., reading, computer work, deskwork, playing handheld video games, or doing crafts):

- Eyestrain (especially with or after reading) headaches.
- Blurred or double vision.
- Inability to concentrate or sustain attention frequent loss of place.
- Squinting, rubbing, closing or covering an eye.
- Words appear to move, jump, swim or float.
- Problems with motion sickness and/or vertigo.

Note: None of these symptoms is explicitly related to learning to decode and spell; however, they can impact a student’s ability to sustain effort for the duration of reading instruction.

It is not unusual for a person with convergence insufficiency to cover or close one eye while reading to relieve the blurring or double vision. However, many people who would test as having convergence insufficiency, if tested, may not complain of double vision or the other symptoms listed above because vision in one eye has shut down. In other words, even though both eyes are open and are healthy and capable of sight, the person's brain ignores one eye to avoid double vision. Ignoring double vision is a neurologically active process called suppression¹.

How is CI Diagnosed?

An ophthalmologist and optometrist are licensed eye care specialists trained to diagnose CI. An orthoptist (a medical technician specifically trained in ocular muscle function and binocular vision) works under a licensed eye care specialist to provide vision therapy. Convergence insufficiency is diagnosed by an examination including:

- Determination of the distance from the eyes that the patient can hold the eyes together without double vision (near point of convergence) and the amount of prism that can be placed in front of the eyes at a particular distance before double vision is seen (fusional vergence amplitude).
- Presence of any refractive errors, eye muscle dysfunction, or weaknesses in accommodation (near focusing) may also be determined.

Convergence insufficiency disorder frequently goes undetected in school-aged children because proper testing is not included in school eye screenings. Additionally, eye tests and screeners² in a pediatrician's office and/or standard eye exams in an optometrist's or ophthalmologist's office may misdiagnose CI without prompting or reporting of symptoms.

How is CI Different from Dyslexia?

Dyslexia and convergence insufficiency are separate issues. Individuals with dyslexia need supports in hearing the sounds, matching sounds to letters, sounding out words, and rapidly processing progressively larger chunks of words. Dyslexia is a language-based learning disability. Individuals with CI need medical interventions that support coordinated eye movement.

Currently, there is no adequate scientific evidence to support the view that subtle eye or visual problems cause learning disabilities. Furthermore, the evidence does not support the concept that

¹ For more information, [view the American Association for Pediatric Ophthalmology and Strabismus \(AAPOS\) website](#).

² Horan, L. A., Ticho, B. H., Khammar, A. J., Allen, M. S., & Shah, B. (2015). Is the convergence insufficiency symptom survey specific for convergence insufficiency? A prospective, randomized study. *American Orthoptic Journal*, 65(1), 99-103.

vision therapy or tinted lenses or filters are effective, directly or indirectly, in the treatment of learning disabilities. Thus, the claim that vision therapy improves visual efficiency cannot be substantiated. Diagnostic and treatment approaches that lack scientific evidence of efficacy are not endorsed or recommended. While it is possible for a child to have both dyslexia and CI, the two are unrelated and require different interventions³. For more information on dyslexia see the Minnesota Department of Education (MDE) resource “[Navigating the School System When a Child is Struggling with Reading or Dyslexia.](#)”

Vision Therapy Guidance

According to the American Optometric Association, optometric vision therapy (also referred to as visual training, developmental vision therapy, behavioral vision therapy and ortho-optic vision therapy) is a treatment regimen to correct or improve specific dysfunctions of the vision system identified by standardized diagnostic criteria.

Vision therapy is a medical intervention which has been found to be most effective with a comprehensive eye exam followed by a treatment plan administered in a medical office under the guidance of a licensed eye care specialist. Vision therapy is typically of short duration (see description of medical treatments below)⁴.

Vision therapy is not typically considered a related service under the Individuals with Disabilities Education Act (IDEA). A student must first qualify as having a disability and need specially designed instruction. It is likely that the condition would be diagnosed and treated as part of establishing evidence of a disability. The existing procedures for identifying a student, determining eligibility, and providing services apply. Teams will need to gather all relevant data to determine eligibility and the necessary services and supports to access and make progress in the general curriculum. The individualized education program (IEP) team will determine the most appropriate services and

³ Handler, S. and Ferson, W. (2011). Joint Technical Report—Learning Disabilities, Dyslexia, and Vision. The Section on Ophthalmology and Council on Children with Disabilities, American Academy of Ophthalmology, American Association for Pediatric Ophthalmology and Strabismus, and American Association of Certified Orthoptists. 2010-3670; DOI: 10.1542/peds.2010-3670.

The joint policy statement was reaffirmed in 2014 and [can be retrieved from the American Academy of Ophthalmology website](https://www.aao.org/clinical-statement/joint-statement-learning-disabilities-dyslexia-vis) (https://www.aao.org/clinical-statement/joint-statement-learning-disabilities-dyslexia-vis).

⁴ Lawson, H., Lueck, A., Moo, M., Topor, I. (2017). The Role and Training of Teachers of Students with Visual Impairment (TSVIs) as a Special Educator and Why TSVIs Do Not Provide Vision Therapy Services. Policy statement from Association for Education and Rehabilitation of the Blind and Visually Impaired.

supports for a student qualifying for special education. The services and supports determined by the IEP team are covered under IDEA.

Medical Treatment of Convergence Insufficiency

Current treatments for CI can be categorized as active or passive. However, none of the following treatments will have an impact on a student's ability to acquire the basic skills of reading beyond increasing the length of time a student can focus on near tasks comfortably. The treatments and effectiveness of research are listed below:

- **Active treatment:** A multi-site randomized clinical trial funded by the National Eye Institute has proven that the best treatment for convergence insufficiency is supervised vision therapy in a clinical office with home reinforcement (15 minutes of prescribed vision exercises done in the home five days per week). The scientific study showed that children responded quickly to this treatment protocol; 75 percent achieved either full correction of their vision or saw marked improvements within 10-12 weeks (Ajanmian, 2008) (Eisenberg, 2008).
- **Passive treatment:** Prismatic (prism) eyeglasses can be prescribed to decrease some of the symptoms. Although prism eyeglasses can relieve symptoms, they are not a "cure" and the patient typically remains dependent on the prism lenses. Scientific research as well as optometric and ophthalmological textbooks agree that the primary treatment of convergence insufficiency should be vision therapy (Cooper and Cooper, 2005) (Charters, 2013).
- **Pencil Push-ups:** Scientific research is ambivalent on the effectiveness of this method. Studies done on pencil push-ups have shown it to be effective in some cases and not in others (Momeni-Moghaddam, 2015) (Gallaway, 2002) (Convergency insufficiency treatment trial study group. Randomized clinical trial of treatments for symptomatic convergence insufficiency in children).
- **Surgical Care:** Eye muscle surgery should only be considered with a licensed eye care specialist's recommendation (Cooper, 2001-2005).

What should schools do with a diagnosis of CI from a Licensed Eye Care Specialist?

Given a diagnosis from a licensed eye care specialist, optometrist or ophthalmologist, the school team needs to review the impact on student access and progress just as with any other diagnosed disorder or disability.

Educational Implications

A child's educational team including general education teacher, parent, child, or school counselor has options for continuing to support a child within the educational environment. Examples include:

- Providing interventions that are focused on academic skills instruction to support the student in acquiring skills that were missed due to limitations with coordinating vision.
- Conducting an evaluation for a 504 plan for classroom accommodations to address limitations with stamina and fatigue that become barriers to accessing the general curriculum. Examples may include but are not limited to materials with higher contrast, double spacing, or use of alternate formats.
- Conducting a comprehensive evaluation, including a review of all existing information, to determine the presence of disability and need for special education as defined under IDEA. Data from a licensed eye care specialist may be required to meet eligibility criteria.

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