
Subject: Vision Therapy/Orthoptics
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INSTRUCTIONS FOR USE

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Vision therapy and orthoptics are considered experimental, investigational or unproven and not medically necessary for the management of visual disorders and learning disabilities.

General Background

Vision therapy is a proposed optometric treatment method for developing efficient visual skills and processing. It has been proposed as a treatment for accommodative disorders, amblyopia, binocular disorders (strabismic and nonstrabismic), learning disabilities and ocular motility disorders. Vision therapy involves a sequence of activities individually prescribed and monitored by an optometrist or ophthalmologist with the therapeutic goal of correcting or improving specific dysfunctions of the visual system (American Academy of Ophthalmology [AAO], American Optometric Association [AOA], 1999). The AAO distinguishes between two categories of vision therapy: orthoptic and behavioral.

Orthoptics is a system of eye exercises intended to improve eye movement and visual tracking. The exercises are used not only to strengthen eye muscles, but also to improve the coordination, efficiency and functioning of the visual system. Classic orthoptic techniques are used to correct accommodative (i.e., focusing) and convergence dysfunctions, as well as heterophorias (i.e., latent misaligned eyes) and refractive errors that might be responsible for eye fatigue and discomfort that are often aggravated by close work. Eye exercises, or orthoptics, have been proposed to aid specific vision problems, such as poor eye coordination, amblyopia, crossed eyes, misalignment of eyes (i.e., double vision), and inability to focus both eyes within the normal reading range. In general, ophthalmologists more narrowly define orthoptics as eye exercises provided by an orthoptist under the supervision of an ophthalmologist. The optometric definition is broader and is usually synonymous with vision therapy.

In the second category, often referred to as behavioral vision therapy, eye movement and eye-hand coordination training techniques are intended to improve visual processing skills, learning efficiency and visual-motor integration (AAO, 2001).

Modalities used in vision therapy include orthoptics or eye exercises, occlusion (i.e., eye patching) therapy, and behavioral training, as well as prescriptive or prismatic lenses, filters, computer-based training, and other materials and equipment. Colored lenses or overlays are sometimes used as part of a vision therapy program to alter contrast. A program of vision therapy involves multiple visits and practice at home over a period of several weeks to several months (AAO, AOA, 1999). A typical program may involve 24–32 visits over the course of several months, with instructions for a follow-up program to continue at home.

Visual Disorders

Accommodative Disorders: Accommodation is the eye's ability to adjust its focus by the action of the ciliary muscle, which controls the curvature of the lens. Proper functioning of this accommodative skill allows the eye to focus and refocus quickly and effortlessly (Hayes, 2002). Accommodative disorders include accommodative spasm or excess, accommodative infacility, accommodative insufficiency and ill-sustained accommodation. A review of the published, peer-reviewed, scientific literature finds insufficient evidence to support the use of vision therapy in the treatment of accommodative disorders. In general, studies have been of poor design quality, with limitations that included retrospective design, lack of controls, patient selection bias, and small participant numbers.

Amblyopia: Amblyopia, or poorly developed vision in one eye, is one of the most common conditions treated by vision therapy techniques. Causes of amblyopia include strabismus, unequal focus which is correctable with glasses, and cloudiness in normally clear eye tissue (e.g., cataracts). The aim of treatment is to encourage use of the weak eye. Patching the dominant eye (i.e., occlusion therapy) is considered standard of care for amblyopia. Another technique used to strengthen the affected eye is the instillation of atropine sulfate drops to blur the dominant eye. The optimal time to correct amblyopia is during early childhood.

Evidence in the scientific, peer-reviewed literature indicates that occlusion therapy is safe and effective for the treatment of amblyopia. The Pediatric Eye Disease Investigator Group conducted a randomized, controlled, multicenter study that compared the use of atropine with that of occlusion therapy for the treatment of moderate amblyopia. The authors concluded that both modalities produce improvement in amblyopia of similar magnitude.

Evidence supporting other vision therapy techniques as treatments for amblyopia has generally been of poor quality, with significant methodological flaws in the studies. Although several studies have been conducted, they used a wide variety of vision therapy interventions and approaches, making it difficult to compare outcomes across studies. Much of the evidence is in the form of case studies and small case series, often with patients who have failed occlusion therapy, a passive treatment. Because of the lack of well-designed and well-implemented studies, with the exception of eye patching, insufficient evidence exists in the published, peer-reviewed literature to support the use of vision therapy modalities for the treatment of amblyopia.

Binocular Vision Disorders (Strabismic and Nonstrabismic Conditions): Normal binocular vision depends on motor alignment, coordination of the eyes, and sensory fusion (i.e., sensory integration of information from the two eyes). Symptoms of binocular eye problems include eyestrain, difficulty focusing, double vision, and headache. Disorders in this category involve difficulty in fusing or combining information from each eye to form one fused image. Binocular disorders include strabismic and nonstrabismic dysfunctions.

Strabismic vision disorders are characterized by the inward or outward deviation of one or both eyes, causing the two eyes to be directed to different points when viewing the same object. Strabismic conditions include esotropia (eye turns inward) and exotropia (i.e., eye turns outward). These conditions may be congenital or result from trauma or disease. Strabismus may result in diplopia, suppression of vision of one eye, amblyopia, impaired depth perception and an undesirable appearance. Strabismus is a common visual abnormality found in children. Adult-onset, acquired strabismus (e.g., due to trauma) is a misalignment that occurs after normal binocular vision has developed. It may be too late for adults with untreated congenital strabismus to treat the associated amblyopia and depth perception impairment; therefore, the goal of adult treatment is often purely cosmetic. Treatment for acquired or congenital strabismus in children is usually aimed at restoring the ability to maintain single binocular vision and fusion of images and at improving impaired depth perception. Interventions for treating strabismus include surgery to the extraocular muscles and optical manipulations with corrective glasses, as well as miotic and mydriatic medications and botulinum toxin.

Vision therapy modalities have been proposed as treatments for strabismic conditions. Supporting evidence exists primarily in the form of case studies and case series. Limitations to the reported evidence include varied treatment approaches, small sample sizes, lack of control groups, lack of randomization, limited follow-up, patient selection bias, and lack of standardization of treatment and outcome measures.

One large, multicenter clinical trial supported by the National Eye Institute (NEI) yielded evidence to suggest that the use of prism adaptation is appropriate prior to surgery as a treatment for acquired esotropia. The Prism Adaptation Study (PAS) defined prism adaptation as the preoperative wearing of Fresnel prisms to offset the angle of esotropia, with adjustment of prism power over time to accommodate buildup to larger angles of esotropia until fusion is achieved or until it has been demonstrated that fusion cannot be attained (Hayes, 2002). Insufficient evidence exists in the published, peer-reviewed literature to conclude that vision therapy is effective for the treatment of any of the strabismic disorders except preoperative prism adaptation for acquired esotropia.

In nonstrabismic disorders, the eyes tend to turn, although this tendency is controlled at times. Nonstrabismic binocular dysfunctions include convergence insufficiency, convergence excess, divergence insufficiency, and divergence excess. The major consequence of any nonstrabismic anomaly of binocular vision is asthenopia, the subjective symptoms of ocular fatigue that include eyestrain, discomfort and headaches arising from use of the eyes (Hayes, 2002).

The Convergence Insufficiency Treatment Trial (CITT), also supported by the NEI, is a multicenter study currently underway which will examine the efficacy of vision therapy/orthoptics. Scheiman et al. (2005) conducted two pilot studies for the CITT. These two randomized, controlled trials (RCTs), one with children ages 9–18 (n=47) and the other with young adults ages 19–30 (n=46), compared the efficacy of a 12-week program of vision therapy/orthoptics with placebo or the standard treatment of pencil push-ups. The investigators reported treatment with vision therapy/orthoptics to be more effective than either of the other treatments in reducing symptoms of convergence insufficiency in children. For the young adults studied, vision therapy/orthoptics was reported to be the only intervention that produced clinically significant changes in the measures of near-point convergence and positive fusional vergence ($p < 0.001$). The authors noted that more than half (58%) of the young adults who received vision therapy continued to have symptoms of convergence insufficiency. These preliminary results were thought to support the need for a large-scale RCT (Scheiman et al., 2005). The CITT is expected to be completed in 2008.

Aziz et al. (2007) examined the effectiveness of orthoptic exercises near point of convergence, fusion range and asthenopic symptoms. Information was collected from case records related to diagnosis, near point of convergence, fusion range, prism and cover test measurements and symptoms. The diagnoses included decompensating heterophoria (n=50) or convergence insufficiency (n=28). Exophoria was more common (n = 65) than esophoria (n=11) or orthophoria (n=1). Patients with amblyopia, Meares Irlen syndrome/dyslexia, a history of previous treatment with eye exercises or squint surgery were excluded. The age range was 5–73 years with a mean of 11.9 years. The mean treatment period was 8.2 months; for most subjects, treatment was completed in a year. Convergence exercises included pen convergence, dot card, and jump convergence. Fusion exercises comprised stereograms and a Fresnel prism bar. Reduced near point of convergence normalized following treatment in 47/55 cases, and mean near point of convergence improved from 16.6 to 8.4 cm ($p = 0.0001$). Fusional reserves normalized in 29/50 cases. Fusional convergence improved significantly for those with exodeviation ($p > 0.0006$). Asthenopic symptoms improved in 65 patients. The investigators reported that orthoptic exercises are an effective means of reducing symptoms in patients with convergence insufficiency and decompensating exophoria (Aziz, et al., 2007). However, the study is limited by its retrospective design, lack of a control group, and small sample size.

The role of vision therapy in managing nonstrabismic binocular disorders has not been established. Available evidence exists primarily in the form of uncontrolled or poorly controlled studies with significant methodological flaws. Limitations of the available data include lack of long-term data, patient selection bias, failure to use controls, and retrospective design.

Myopia, Hyperopia and Astigmatism: The AAO, in a complementary therapy assessment of visual training for refractive errors, found no evidence that visual training has any effect on the progression of myopia or that it results in the improvement of visual function for patients with hyperopia or astigmatism (AAO, 2004).

Learning Disabilities

The use of vision therapy techniques to treat learning disabilities stems from the association between vision and learning, i.e., the role of oculomotor skills and visual perception in learning skills such as

reading and writing. Vision therapy practitioners identify three interrelated areas of visual function which they suggest should be evaluated to identify learning-related visual problems (AAO, 2001):

- visual pathway integrity, including eye health, visual acuity and refractive status
- visual efficiency, including accommodation (focusing), binocular vision (eye teaming) and eye movements
- visual information processing, including identification and discrimination, spatial awareness, and integration with other senses

An ICSI (Institute for Clinical Systems Improvement) technology assessment found vision therapy to be safe when preceded by a comprehensive eye examination that rules out a serious condition requiring medical or surgical intervention. According to the ICSI committee, a review of available studies provided inadequate scientific evidence to allow for a conclusion to be drawn about the efficacy of vision therapy for patients with learning disabilities, amblyopia, strabismus, convergence insufficiency or accommodative disorders (ICSI, 2003).

Rawstron et al. (2005) conducted a systematic review of the evidence evaluating the efficacy of eye exercises. The authors concluded that small controlled trials and a large number of cases support the treatment of convergence insufficiency. Less robust evidence was found to indicate that visual training may be useful in developing fine stereoscopic skills and improving visual field remnants after brain damage. It was stated that there is no clear evidence in the published literature to support the use of eye exercises in a wide range of conditions including vergence problems, ocular motility disorders, accommodative dysfunction, amblyopia, learning disabilities, dyslexia, asthenopia, myopia, stereopsis, visual field defects and visual acuity. Therefore, the use of eye exercises in the treatment of these conditions remains controversial (Rawstron, et al., 2005).

A review of the published, peer-reviewed, scientific literature finds no consistent evidence to support vision therapy, in the form of either orthoptic vision therapy or behavioral vision therapy, or through the use of colored overlays or lenses, for the treatment of any type of learning or reading disability. The available evidence does not support the conclusion that vision therapy improves reading comprehension.

Professional Societies/Organizations

According to the AAO, several studies have demonstrated that eye movements and visual perception are not critical factors in the reading impairment found in dyslexia; brain processing of language appears to play a greater role. The vast majority of individuals with known ocular motility and eye movement defects appear to read and comprehend normally (AAO, 2001). The hypothesis that abnormal eye function is associated with difficulty in reading and non-reading visual information-processing tasks has not been proven.

The AAO and the American Academy of Optometry (AOA) acknowledge that vision therapy does not treat learning disabilities or dyslexia but rather improves visual efficiency and visual processing so that the individual can be more responsive to educational instruction (AAO and AOA, 1999). Because of the lack of scientific evidence supporting the use of vision therapy as a treatment for reading disorders, dyslexia and learning disabilities, the American Academy of Pediatrics (AAP), the AAO, and the American Association of Pediatric Ophthalmology and Strabismus (AAPOS) do not recognize vision therapy as an effective treatment for these conditions.

The AAO states that “coordinated multidisciplinary treatment by a team consisting of various medical specialists, educators, tutors, psychologists, and rehabilitation specialists (occupational/physical therapists) gives individuals with learning differences the best means of reaching their optimal educational and learning potential” (AAO; 2001, 2007).

Summary

Insufficient evidence exists in the published, peer-reviewed, scientific literature to support the use of vision therapy, visual training, vision training, behavioral vision therapy or orthoptics for any of the following conditions:

- accommodative disorders, including accommodative spasm or excess, accommodative infacility, accommodative insufficiency and ill-sustained accommodation
- amblyopia (except for occlusion therapy, as previously noted)
- strabismic binocular disorders, including esotropia (except for preoperative prism adaptation for acquired esotropia, as noted above), exotropia and hypertropia
- nonstrabismic binocular disorders, such as convergence insufficiency, convergence excess, divergence insufficiency and divergence excess
- learning disabilities, including, but not limited to, reading disabilities, attention-deficit/hyperactivity disorder, and dyslexia
- myopia, hyperopia, presbyopia and astigmatism
- ocular motility disorders, eye movement disorders, and oculomotor dysfunctions
- visual information processing disorders, including visual-motor integration and integration with other sensory modalities

Coding/Billing Information

Note: This list of codes may not be all-inclusive.

Experimental/Investigational/Unproven/Not medically necessary:

CPT* Codes	Description
92065	Orthoptic and/or pleoptic training with continuing medical direction and evaluation

HCPCS Codes	Description
	No specific codes

ICD-9-CM Diagnosis Codes	Description
	All codes

*Current Procedural Terminology (CPT®) © 2007 American Medical Association: Chicago, IL.

References

1. American Academy of Ophthalmology. Complementary therapy assessment. Vision therapy for learning disabilities. American Academy of Ophthalmology Complementary Therapy Task Force. 2001 Sep 1. Accessed Oct 4, 2004, Oct 11, 2007. Available at URL address: <http://www.aao.org/aao/education/library/cta/index.cfm>
2. American Academy of Ophthalmology. Complementary therapy assessment. Visual training for refractive errors. American Academy of Ophthalmology Complementary Therapy Task Force. 2001 Sep 1. October 2004. Accessed Oct 11, 2005. Available at URL address: http://www.aao.org/aao/education/library/cta/upload/visual_training_2004.pdf
3. American Academy of Optometry. Vision therapy. A joint organizational policy statement of the American Academy of Optometry and the American Optometric Association. June, 1999. Accessed Oct 4, 2004. Available at URL address: <http://www.aaopt.org/about/position/index.asp>
4. American Academy of Pediatrics. Policy statement. Learning disabilities, dyslexia, and vision: a subject review. Pediatrics. 1998 Nov;102(5):1217-9. Accessed Oct 4, 2004. Available at URL address: <http://www.aap.org/policy/re9825.html>

5. Aziz S, Cleary M, Stewart HK, Weir CR. Are orthoptic exercises an effective treatment for convergence and fusion deficiencies? *Strabismus*. 2006 Dec;14(4):183-9.
6. Birnbaum MH, Soden R, Cohen AH. Efficacy of vision therapy for convergence insufficiency in an adult male population. *J Am Optom Assoc*. 1999 Apr;70(4):225-32.
7. Bouldoukian J, Wilkins AJ, Evans BJ. Randomised controlled trial of the effect of colored overlays on the rate of reading of people with specific learning difficulties. *Ophthalmic Physiol Opt*. 2002;22(1):55-60.
8. Brar GS, Bandyopadhyay S, Kaushik S, Raj S. Efficiency of occlusion therapy for management of amblyopia in older children. *Indian J Ophthalmol*. 2006 Dec;54(4):257-60.
9. Brookes RL, Nicolson RI, Fawcett AJ. Prisms throw light on developmental disorders. *Neuropsychologia*. 2007 Apr 9;45(8):1921-30. Epub 2007 Jan 30.
10. Cleary M. Efficacy of occlusion for strabismic amblyopia: can an optimal duration be identified? *Br J Ophthalmol*. 2000;84:572-8.
11. Ciuffreda KJ. The scientific basis for and efficacy of optometric vision therapy in nonstrabismic accommodative and vergence disorders. *Optometry*. 2002 Dec;73(12):735-62.
12. EyeCare America®, Foundation of the American Academy of Ophthalmology (AAO). Vision Therapies for Learning Disabilities. Reviewed May 2007. Accessed Oct 11, 2007. Available at URL address: <http://www.eyecareamerica.org/eyecare/treatment/alternative-therapies/vision-therapies-learning-disabilities.cfm>
13. FitzGerald DE, Krumholtz I. Maintenance of improvement gains in refractive amblyopia: a comparison of treatment modalities. *Optometry*. 2002 Mar;73(3):153-9.
14. Gallaway M, Scheiman M. The efficacy of vision therapy for convergence excess. *J Am Optom Assoc*. 1997;68:81-6.
15. Greenwald MJ. Refractive abnormalities in childhood. *Pediatr Clin North Am*. 2003 Feb;50(1):197-212.
16. HAYES Medical Technology Directory™. Vision Therapy for Visual Dysfunctions and Dyslexia and Other Reading Disabilities. Lansdale, PA: HAYES, Inc.; ©2002 Winifred S. Hayes, Inc. Originally published 1993 Sept. Update 2002 Oct.
17. Helveston EM. Visual training: current status in ophthalmology. *Am J Ophthalmol*. 2005 Nov;140(5):903-10.
18. Hertle RW, Scheiman MM, Beck RW, Chandler DL, Bacal DA, Birch E, et al. Stability of visual acuity improvement following discontinuation of amblyopia treatment in children aged 7 to 12 years. *Arch Ophthalmol*. 2007 May;125(5):655-9.
19. Holmes JM, Beck RW, Kraker RT, Astle WF, Birch EE, Cole SR, et al. Risk of amblyopia recurrence after cessation of treatment. *J AAPOS*. 2004 Oct;8(5):420-8.
20. Institute for Clinical Systems Improvement (ICSI). Technology assessment report. Vision therapy. 2003 Jan. Accessed Oct 4, 2004. Available at URL address: <http://www.icsi.org/knowledge/detail.asp?catID=107&itemID=753>
21. Krumholtz I, FitzGerald D. Efficacy of treatment modalities in refractive amblyopia. *J Am Optom Assoc*. 1999 Jun;70(6):399-404.

22. Kushner BJ. Atropine vs patching for the treatment of moderate amblyopia in children. *Arch Ophthalmol*. 2002;120(3):387-8.
23. Leiba H, Shimshoni M, Oliver M, Gottesman N, Levartovsky S. Long-term follow-up of occlusion therapy in amblyopia. *Ophthalmology*. 2001;108(9):1552-5.
24. Mittelman D. Amblyopia. *Pediatr Clin North Am*. 2003 Feb;50(1):189-96.
25. National Eye Institute (NEI). Amblyopia treatment study: occlusion versus pharmacologic therapy for moderate amblyopia. Press release announcing results. Clinical studies supported by the National Eye Institute. Updated 2002 Mar 13. Accessed Oct 5, 2004. Available at URL address: <http://www.nei.nih.gov/neitrials/static/study73.htm>
26. National Eye Institute (NEI). Report of the Strabismus, Amblyopia, and Visual Processing Panel. Vision-Research-A National Plan: 1999-2003. Accessed Oct 5, 2004. Available at URL address: http://www.nei.nih.gov/resources/strategicplans/neiplan/frm_strabismus.asp
27. Olitsky SE, Nelson LB. Reading disorders in children. *Pediatr Clin North Am*. 2003 Feb;50(1):213.
28. Pediatric Eye Disease Investigator Group, The. A randomized trial of atropine vs. patching for treatment of moderate amblyopia in children. *Arch Ophthalmol*. 2002 Mar;120(3):268-78.
29. Rawstron JA, Burley CD, Elder MJ. A systematic review of the applicability and efficacy of eye exercises. *J Pediatr Ophthalmol Strabismus*. 2005 Mar-Apr;42(2):82-8.
30. Repka MX, Connett JE, Scott WE. The one-year surgical outcome after prism adaptation for the management of acquired esotropia. *Ophthalmology*. 1996;103:922-8.
31. Repka MX, Holmes JM, Melia BM, Beck RW, Gearing MD, Tamkins SM, et al. The effect of amblyopia therapy on ocular alignment. *J AAPOS*. 2005 Dec;9(6):542-5.
32. Robinson GL, Foreman PJ. Scotopic sensitivity/Irlen syndrome and the use of colored filters: a long-term placebo-controlled and masked study of reading achievement and perception of ability. *Percept Mot Skills*. 1999;89:83-113.
33. Robinson GL, Foreman PJ. Scotopic sensitivity/Irlen syndrome and the use of colored filters: a long-term placebo-controlled study of reading strategies using analysis of miscue. *Percept Mot Skills*. 1999;88:35-52.
34. Scheiman M, Cotter S, Rouse M, Mitchell GL, Kulp M, Cooper J, et al. Randomised clinical trial of the effectiveness of base-in prism reading glasses versus placebo reading glasses for symptomatic convergence insufficiency in children. *Br J Ophthalmol*. 2005 Oct;89(10):1318-23.
35. Scheiman M, Mitchell GL, Cotter S, Kulp M, Cooper J, Rouse M, et al. A randomized clinical trial of vision therapy/orthoptics versus pencil pushups for the treatment of convergence insufficiency in young adults. *Optom Vis Sci*. 2005 Jul;82(7):583-95.
36. Scheiman MM, Hertle RW, Beck RW, Edwards AR, Birch E, Cotter SA, et al. Randomized trial of treatment of amblyopia in children aged 7 to 17 years. *Arch Ophthalmol*. 2005 Apr;123(4):437-47.
37. Stein JF, Richardson AJ, Fowler MS. Monocular occlusion can improve binocular control and reading in dyslexics. *Brain*. 2000;123:164-70.
38. Ticho BH. Strabismus. *Pediatr Clin North Am*. 2003 Feb;50(1):173-88.