Vision Therapy/Orthoptics

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Attention-Deficit/Hyperactivity Disorder (ADHD): Assessment and Treatment
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Coverage Policy

Coverage for Vision Therapy/Orthoptics varies across plans. Refer to the customer's benefit plan document for coverage details.

Vision therapy/orthoptics is considered experimental, investigational or unproven for any indication.

Overview

This Coverage Policy addresses in-office vision therapy/orthoptic and/or pleoptic training.

General Background

According to the American Association for Pediatric Ophthalmology and Strabismus, “vision therapy” is a term used by optometrists. Optometrists define vision therapy as an attempt to develop or improve visual skills and abilities; improve visual comfort, ease, and efficiency; and change visual processing or interpretation of visual information. An optometric vision therapy program consists of supervised in-office and at home reinforcement exercises performed over weeks to months. In addition to exercises, lenses (“training glasses”), prisms, filters, patches, electronic targets, or balance boards may be used. There are three main categories of vision therapy:

- Orthoptic vision therapy so called by optometrists are a series of exercises usually weekly over several months performed in the optometric office. Orthoptic eye exercises (orthoptics), as used by pediatric
ophthalmologists and orthoptists, are eye exercises to improve binocular function and are taught in the office and carried out at home.

- Behavioral/perceptual vision therapy – eye exercises to improve visual processing and visual perception
- Vision therapy for prevention or correction of myopia (nearsightedness)
  (American Association for Pediatric Ophthalmology and Strabismus, 2016).

Convergence insufficiency occurs when eyes do not turn inward properly while focusing on a nearby object. When looking at a close object, eyes should converge — turn inward together to focus — so that they provide binocular vision and a single image. But with convergence insufficiency, an individual is unable to move their eyes inward to focus normally. It is usually diagnosed in school-age children and adolescents.

Amblyopia is reduced vision in one eye caused by abnormal visual development early in life. The weaker — or lazy — eye often wanders inward or outward. Amblyopia generally develops from birth up to age 7 years. It is the leading cause of decreased vision in one eye among children. Pleoptics training treats amblyopia using guided exercises.

**Literature Review – Overview**

Convergence insufficiency (CI) is the most common disorder evaluated in vision therapy/orthoptics studies. There are few modern, randomized controlled trials evaluating office-based vision therapy/orthoptics in CI patients. Most published studies are all reporting from the same trial/study population, and are versions of the Convergence Insufficiency Treatment Trial (CITT). After reviewing the recent published, peer-reviewed literature for CI as well as professional society opinion, the following conclusions can be drawn:

1. There is not a standard definition of what an ‘in-office vision therapy/orthoptic visit’ consist of.
2. There are not professional society standard of care recommendations for what vision therapy treatment/regimes should or should not include, length of treatment, or recommended target diagnoses based upon sustained long term health benefits.
3. Studies evaluating the use of vision therapy in convergence insufficiency do not demonstrate any superiority of a specific exercise regime of in-office vision therapy/orthoptics over another. There is insufficient evidence evaluating the use of orthoptic vision therapy for diagnoses other than CI.

**Literature Review – Detail**

Current peer-reviewed scientific literature primarily addresses the diagnosis of convergence insufficiency (CI) and lacks consensus when defining standard in-office vision therapy/orthoptics as well as does not demonstrate that in-office vision therapy/orthoptics is superior to other treatments (e.g., at home/computer exercises, corrective lenses). There is insufficient evidence evaluating diagnoses other than CI.

The Convergence Insufficiency Treatment Trial (CITT) Study Group (Scheiman, et al., 2010; CITTSG, et al., 2009; CITTSG, et al., 2008) conducted a randomized clinical trial including 221 children age nine to 17 with symptomatic convergence insufficiency (CI). Participants were randomly assigned one of the following treatments:

- home-based pencil push-ups (HBPP); 15 minutes / 5 days per week
- home-based computer vergence/ accommodative therapy and pencil push-ups (HBCVAT+); 15 minutes of therapy per day on computer software and 5 minutes per day of pencil push-ups for 5 days per week
- office-based vergence/ accommodative therapy with home reinforcement (OBVAT); weekly 60-minute in-office therapy visit with additional home therapy procedures prescribed for 15 minutes a day, 5 days per week.
- office-based placebo therapy with home reinforcement (OBPT); also received therapy during a weekly 60-minute office visit and were prescribed procedures to be performed at home for 15 minutes per day, 5 days per week; however, their therapy procedures were designed to resemble real vergence/accommodative therapy procedures yet not stimulate vergence, accommodation, or fine saccadic eye movement skills beyond normal daily visual activities.

The primary outcome measure was the change in the Convergence Insufficiency Symptom Survey (CISS) score from baseline to treatment completion after 12 weeks of therapy; the secondary outcome measures were the change in Near Point of Convergence (NPC) and in Positive Fusional Vergence (PFV) from baseline to treatment completion.
CITT results at 12 weeks: Using a composite measure of CISS, NPC, and PFV, the percentage of patients classified as successful or improved was significantly greater in the OBVAT group (73%) than in the other three groups (43% in HBPP, 33% in HBCVAT+, and 35% in OBPT; p≤0.002). No other differences were observed at week 12 (p≥0.50). The authors noted that although the length of therapy required to achieve optimum results is not known; OBVAT resulted in a more rapid improvement in symptoms and clinical measures, as well as a greater percentage of patients classified as successful or improved when compared with HBPP, HBCVAT+, or OBPT.

CITT results at one year: Note, this portion of the trial is not randomized. Of the 221 patient population described above, 70 patients were evaluated at one year (completion rate was 89%, 70 of 79): OBVAT = 33; HBPP = 18; HBCVAT+ = 12; and OBPT = 16. At completion of the 12 week treatment program, patients were classified as either asymptomatic (CISS score < 16) or symptomatic (CISS score ≥ 16). Symptomatic patients were offered alternative treatment at no cost. Asymptomatic patients were assigned home maintenance therapy (described below) for 15 minutes per week for the initial 6 months following treatment discontinuation. No home therapy was prescribed between the 6- and 12- month follow-up visits. The primary outcome measure was the mean change in the CISS score from the 12-week outcome visit to the 6- and 12-month follow-up examinations. Patients in each group were instructed to perform 15 minutes of maintenance therapy once per week for the first 6 months following completion of treatment. The OBVAT group performed one convergence technique (Brock String or Barrel Card) and one fusional vergence technique (Eccentric Circles or Lifesaver Cards). Patients in the HBPP were asked to do pencil push-ups for 15 minutes while those in the HBCVAT+ group did 5 minutes of pencil push-ups and 10 minutes of computer vergence therapy. The patients in the OBPT group were instructed to use the TV Trainer (watch television covered by a neutral density filter while wearing Polaroid glasses) for 10 minutes and work with playing cards (plays cards while wearing Polaroid glasses) for 5 minutes.

CITT Summary: There were no significant changes in the CISS in any treatment group during the 1-year follow-up. The percentage who remained asymptomatic in each group was 84.4% for OBVAT, 66.7% for HBPP, 80% for HBCVAT+, 76.9% for OBPT. The percentage who remained either asymptomatic/successful or improved 1-year post-treatment was 87.5% (28/32) for OBVAT, 66.6% (10/15) for HBPP, 80% (8/10) for HBCVAT+, 69.3% (9/13) for OBPT. In summary, the overall 1-year probability of symptoms or signs recurring varied from 33% in the HBPP group to 16% in the OBVAT group (Scheiman, et al., 2010; CITTSG, et al., 2009; CITTSG, et al., 2008).

In a controlled, prospective trial, Dusek et al. (2011) compared 134 children age 7-14 years with CI. Two different types of treatment for CI were employed: a computerized home visual therapy system (HTS) (N=51) or 8Δ base-in reading glasses (N=51). The computerized visual therapy system is used by the subject in his or her home environment and uses images that the subject has to fuse in order to perceive three dimensional (stereoscopic) images. These stereoscopic images are resolved using red/blue spectacles. A full visual assessment including reading speed and accuracy were conducted pre- and post-treatment. Factorial analyses demonstrated statistically significant changes between results obtained for visits 1 and 2 for total reading time, reading error score, amplitude of accommodation and binocular accommodative facility (within subjects effects) (p<0.05). Significant differences were also demonstrated between treatment groups for total reading time, reading error score and binocular accommodative facility (between subjects effects) (p<0.05). The authors concluded that prismatic correction offers an effective treatment option for children with CI and reading difficulties that arise from causes not linked to intellectual ability.

In a prospective study, Nehad et al. (2018) randomized 102 Egyptian children with convergence insufficiency in to two groups: Group I: received Office-based Vision Therapy (OBVT) and Group II: received OBVT with home reinforcement using the Home Therapy System (HTS). OBVT: Patients had a weekly 60-minute in-office therapy. At each office-based therapy session, the patient completed 4-5 procedures, such as the brock string, binocular accommodative rock – flipper, stereograms, vectograms, tranaglyphs and stereoscopes under supervision from one of the authors. HTS Computer Software: Patients performed fusional vergence therapy actions including vergence base-in, vergence base-out, auto-slide vergence, and jump ductions vergence programs by means of random dot stereopsis targets. The HTS software program was used for 20 minutes daily for 6 days/week. At the end of the 12th week of therapy, the applied therapeutic polices were successful in 48 patients (47.1%), the
symptoms were improved in 30 patients (29.4%), improvement was insufficient in 13 patients (12.7%) and 11 patients (10.8%) were considered as non-responders. There was significantly higher frequency of patients with improved outcome in group II (86%) compared to group I (69.2%).

In a prospective, controlled, non-randomized trial, Shin et al. (2011) evaluated 56 children (aged 9–13 years diagnosed with symptomatic CI) at 12 weeks, and 20 of the 56 at one year. Of the 56, 27 had CI only and 29 had combined symptomatic CI and accommodative insufficiency (AI). They were independently divided into a treatment and a control group, matched by age and gender. More subjects were assigned to the treatment group after considering the possibility of subject loss during the course of treatment. The Treatment group visited the school clinic two times per week for 1 hour each treatment session and additionally was prescribed home support procedures to be performed for 15–25 minutes a day during the week. The treatment group received 12 weeks of vision therapy while the control group received no therapy. Of 20 children who completed one year: 17 remain the same; 1 child with CI showed clinical regression of the NPC; 2 children with combined CI and AI had deteriorated. Authors conclude that at one year follow-up examination, most children maintained the improved symptom and clinical measures after vision therapy.

In earlier trials, Scheiman et al. (2005a) conducted a randomized, controlled trial including 72 children aged 9 to <18 years with symptomatic CI assigned to either base-in prism glasses or placebo reading glasses. Patients were reevaluated in the CISS scores (p = 0.33), near point of convergence (p = 0.91), and positive fusional vergence (p = 0.59) were not significantly different between the two groups after 6 weeks of wearing glasses. Scheiman et al. (2005b) evaluated 46 adults age 19 to 30 years of age with symptomatic CI. Participants were randomly assigned to receive 12 weeks of office-based vision therapy/orthoptics, office-based placebo vision therapy/orthoptics, or home-based pencil pushups. The vision therapy/orthoptics group received therapy administered by a trained therapist during a weekly, 60-minute office visit, with additional procedures to be performed at home for 15 minutes a day, five times per week for 12 weeks. Like the vision therapy/orthoptics group, the placebo vision therapy/orthoptics group received therapy administered by a trained therapist during a 60-minute office visit and were prescribed procedures to be performed at home, 15 minutes, five times per week for 12 weeks. The procedures for placebo vision therapy/orthoptics were designed to simulate real vision therapy/ orthoptics procedures without the expectation of affecting vergence, accommodation, or saccadic function. The primary outcome measure was the symptom score on the CISS. Secondary outcome measures were the near point of convergence and the average positive fusional vergence at near. Results demonstrated that office-based vision therapy/orthoptics improved the signs associated with CI. Both the average near point of convergence and the average positive fusional vergence at near improved to roughly normal clinical values, although 58% of the patients in this group were still considered to be symptomatic after 12 weeks of treatment.

In a retrospective report, Adler et al. (2002) studies the efficacy of weekly office-based optometric vision therapy supplemented by daily home practice sessions of between 15 and 20 minutes per day. A total of 92 participants aged 6 to 35 years with a diagnosis of CI in a UK general optometric practice were evaluated. The number of visits for treatment ranged from 2 to 20 office visits. There was no significant correlation between the number of visits and the NPC before or after treatment. The effect of treatment on the NPC was highly significant (p < 0.001). The authors concluded “the results clearly indicate that when CI is defined by NPC alone, vision therapy is an effective form of therapy.

Jang et al. (2017) reported on 32 school age children with symptomatic convergence insufficiency without strabismus, amblyopia, and ocular disease who underwent vision therapy. During vision therapy, the participating children were scheduled to visit the elementary school clinic three times per week, with a duration of 60 minutes for each treatment session. In addition, based VT was supplemented by daily home therapy sessions of 15 minutes per day. Vision therapy consisted of vision therapy via brock string, barrel card, mirror stereoscope, prism goggles, and aperture rule for a duration of 8 weeks. The authors noted that not only near point of convergence was improved, but also the degree of exophoria and positive fusional vergence were improved.

**Literature Review – Systematic Reviews**

In a systematic review of the literature, Rucker and Phillips (2017) reported that convergence exercises reduce symptoms and improve signs of CI in otherwise healthy patients. However, the most efficacious convergence tasks and the optimal duration and frequency of these tasks, remain unknown. The authors also noted that there
is insufficient evidence to recommend “vision therapy” for the treatment of learning disabilities, impaired reading, dyslexia, or ADHD.

In a 2013 evidence review pertaining to convergence insufficiency, Whitecross et al. (2013) concluded “There are limited randomized control trials evaluating the effectiveness of vision therapy, and those that do exist have limitations: small patient populations, differing outcome measures, treatment length and intensity, and placebo effects, which are all confounding factors when assessing the validity of the current studies. Despite the prevalence of convergence insufficiency, the known efficacy of vision therapy remains somewhat questionable. There is evidence to suggest that some form of therapy is effective in reducing symptoms and clinical findings of convergence insufficiency, but there is a lack of equal comparison in order to conclude which forms of treatment are best.”

Professional Societies/Organizations
The US Preventive Services Task Force Evidence Report on Vision Screening in Children Aged 6 Months to 5 Years (Jonas, et al., 2017) does not address convergence insufficiency. The stated objective was to review the evidence on screening for and treatment of amblyopia, its risk factors, and refractive error. The conclusion noted that “Studies directly evaluating the effectiveness of screening were limited and do not establish whether vision screening in preschool children is better than no screening. Indirect evidence supports the utility of multiple screening tests for identifying preschool children at higher risk for vision problems and the effectiveness of some treatments for improving visual acuity outcomes."

The American Academy of Ophthalmology Preferred Practice Pattern® for Esotropia and Exotropia (2017) states Convergence Exercises for Convergence Insufficiency states that orthoptic therapy may improve fusional control in children or adults with convergence insufficiency and with small- to moderate-angle exodeviation (i.e., 20 prism diopters or less), with the goal of strengthening fusional convergence amplitudes. Children and adults with the convergence insufficiency type of exotropia (exotropia greater at near) and asthenopic symptoms with near viewing (typically reading) may be good candidates for orthoptic therapy. Near point of convergence exercises on an accommodative target are useful if the near point of convergence is distant. Convergence exercises with a base-out prism may be beneficial once the near point of convergence improves. Treatment is tapered as symptoms improve, and it may need to be resumed if symptoms recur. Other treatments include computer-based convergence exercises and in-office orthoptics.

The American Academy of Ophthalmology Preferred Practice Pattern® for Amblyopia (2017) states that vision therapy (also termed orthoptics or eye exercises) is defined as a doctor prescribed, nonsurgical program of visual activities to improve visual acuity and binocularity. These include computer programs, prisms, filters, metronomes, vergence activities, accommodation activities, anti-suppression activities, and eye-hand coordination exercises. These are often conducted in an office setting with a therapist, supplemented with home exercises. These treatments have also been promoted for the treatment of amblyopia as an adjunct to patching. However, there is insufficient evidence to recommend vision therapy techniques.

The American Association for Pediatric Ophthalmology and Strabismus and the American Academy of Ophthalmology Joint Policy Statement ‘Amblyopia is a Medical Condition’ (updated 2017) states “Optical correction, such as eyeglasses or contact lenses, may be medically indicated as a part of amblyopia treatment in addition to other modalities, such as patching and/or pharmacologic treatment. Unless amblyopia is treated during childhood, recovery of vision is rarely achieved.”

The American Academy of Pediatrics and American Academy of Ophthalmology Joint Statement on Learning disabilities, dyslexia, and vision (reaffirmed 2014) states that symptomatic convergence insufficiency can be treated with near-point exercises, prism convergence exercises, or computer-based convergence exercises. Most of these exercises can be performed at home, and extensive in-office vision therapy is usually not required. Alternatively, for other patients, reading glasses with base-in prism or minus lenses can be used as treatment.

The American Optometric Association (AOA) Consensus-Based Clinical Practice Guideline ‘Care of the Patient with Accommodative and Vergence Dysfunction’ (CPG18; 1998, revised 2010) addresses vision therapy. Vision therapy is discussed under Management of Accommodative and Vergence Dysfunction, as follows:
Accommodative therapy. The purpose of accommodative therapy is to increase the amplitude, speed, accuracy, and ease of accommodative response. At the end of therapy the patient should be able to make rapid accommodative responses without evidence of fatigue.

Vergence therapy. Fusional vergence therapy improves slow vergence (vergence adaptation); thus it reduces the apparent vergence error. This reduction in the residual vergence error apparently causes a change in the AC/A ratio. Other important functions of slow vergence include maintenance of fusion following blinking, reduction of the fusional demand with the onset of presbyopia, and maintenance of binocularity when age and diseases such as hyperthyroidism have altered orbital contents. If the vergence and accommodative systems are functioning properly when a steady-state level of accommodation or vergence is reached, the slow accommodation and vergence systems maintain accommodation and vergence without effort. The fast and slow vergence and accommodative systems also use proximal, tonic, and voluntary vergence and accommodation to reduce their loads. Defects in any one of these systems alone may not result in asthenopia or strabismus, owing to overlap with components in other systems.

Use Outside of the US
No relevant information.

Coding/Billing Information

Note: 1) This list of codes may not be all-inclusive.
2) Deleted codes and codes which are not effective at the time the service is rendered may not be eligible for reimbursement.

Considered Experimental/Investigational/Unproven when used to report vision therapy/orthoptics:

<table>
<thead>
<tr>
<th>CPT® Codes</th>
<th>Description</th>
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<tbody>
<tr>
<td>92065</td>
<td>Orthoptic and/or pleoptic training, with continuing medical direction and evaluation</td>
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<tr>
<td>97110</td>
<td>Therapeutic procedure, 1 or more areas, each 15 minutes; therapeutic exercises to develop strength and endurance, range of motion and flexibility</td>
</tr>
<tr>
<td>97112</td>
<td>Therapeutic procedure, 1 or more areas, each 15 minutes; neuromuscular reeducation of movement, balance, coordination, kinesthetic sense, posture, and/or proprioception for sitting and/or standing activities</td>
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<tr>
<td>97140</td>
<td>Manual therapy techniques (eg, mobilization/ manipulation, manual lymphatic drainage, manual traction), 1 or more regions, each 15 minutes</td>
</tr>
<tr>
<td>97530</td>
<td>Therapeutic activities, direct (one-on-one) patient contact (use of dynamic activities to improve functional performance), each 15 minutes</td>
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References


