Prior Authorization Review
Panel MCO Policy Submission

A separate copy of this form must accompany each policy submitted for review. Policies submitted without this form will not be considered for review.

<table>
<thead>
<tr>
<th>Plan: Aetna Better Health</th>
<th>Submission Date: 11/01/2018</th>
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<tbody>
<tr>
<td>Policy Number: 0321</td>
<td>Effective Date:</td>
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<tr>
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<td>Revision Date:</td>
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<tr>
<td>Policy Name: Visual Perceptual Training and Vision Restoration Therapy</td>
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</tbody>
</table>

Type of Submission – Check all that apply:
- [x] Revised Policy*
- [ ] Annual Review – No Revisions

*All revisions to the policy must be highlighted using track changes throughout the document. Please provide any clarifying information for the policy below:

CPB 0321 Visual Perceptual Training and Vision Restoration Therapy

Clinical content was last revised 05/24/2017. Additional non-clinical updates were made by Corporate since the last PARP submission, as documented below.

Revision and Update History since last PARP submission:
- 07/31/2018 - This CPB has been updated with additional background information and a reference.
- 03/28/2019 – Next tentative scheduled review date by Corporate

Name of Authorized Individual (Please type or print):
Dr. Bernard Lewin, M.D.

Signature of Authorized Individual:

www.aetnabetterhealth.com/pennsylvania Updated 07/31/2018
Visual Perceptual Training and Vision Restoration Therapy

Number: 0321

*Please see amendment for Pennsylvania Medicaid at the end of this CPB.

Policy

Aetna considers visual perceptual training experimental and investigational for the treatment of perceptual dysfunctions and for all other indications (e.g., body dysmorphic disorder, and reading and/or spelling disorders) because its effectiveness has not been validated in well-designed prospective clinical studies.

Aetna considers vision restoration therapy experimental and investigational for the treatment of visual field deficits due to ischemic optic neuropathy, neurotrauma, or stroke, and for all other indications because its effectiveness has not been validated in well-designed prospective clinical studies.

Note: Visual perceptual training and vision restoration therapy should be distinguished from optometric vision therapy.

See CPB_0489 - Vision Therapy (../400_499/0489.html).
Visual perceptual training is a psycho-educational intervention that focuses on perceptual dysfunctions that are claimed to contribute to delay in speech and language development in preschool children. The *Handbook of Visual Perceptual Training* (Cunningham and Reagan, 1972) (the Handbook) defines visual perception as "that process by which impressions observed through the medium of the eye are transmitted to the brain where relationship to past experiences takes place."

According to the Handbook, "it is concluded that visual perceptual deficits fall into patterns of a syndrome and that each component may impinge upon any number of other factors or may function independently. Visual perceptual dysfunction does not include lack of visual perceptual stimulation; it does involve improper choice of ontogenetic sequencing for such stimulation. It is not a matter of either-or; rather it is a matter of degree. It represents an inefficient developmental functioning that is a handicap to cognitive process. It is related to both cognition and emotional development" (Cunningham and Reagan, 1972). The authors of the Handbook further note that "concomitant factors of visual perceptual dysfunction may be short attention span, hyperactivity, distractibility, social adjustment difficulties, delayed motor perceptual ability, depressed academic achievement, inadequate body image and low frustration level." "Visual perception dysfunction," according to the Handbook, "is to be classified as a learning disability and language disorder."

Visual perception training programs involve an "integrated program involving speech and language activities, a wide range of sensory modalities and visual-motor perceptual activities" (Cunningham and Reagan, 1972). These activities include motor rhythm activities, body image training, as well as training in spatial and directional relationships."
activities are grouped under five main headings: coordination of eye-motor movements, distinguishing foreground from background, visual memory, spatial position and relationship to space ... Included in the activities are speech, language and visual-motor perceptual tasks that involve use of all senses."

Although vision perception training may include some exercises similar to vision therapy exercises, visual perceptual training should be distinguished from optometric vision therapy. Visual perceptual training is directed toward perceptual dysfunctions that allegedly affect language and learning abilities, whereas vision therapy is a set of exercises directed toward specific deficiencies in the movements and/or focusing of the eye (e.g., convergence insufficiency, disorders of accommodation, esophoria, strabismus, etc.). Patients receive vision therapy to treat visual disturbances that may theoretically cause developmental delays and learning disabilities, whereas patients may receive vision perception training to remedy developmental delays and learning disabilities without having any identified dysfunction of eye movements or focusing.

Patients receive vision therapy from eye care professionals, whereas visual perceptual training is generally performed by psychologists, psychotherapists, and other behavioral health professionals.

A position statement by the American Academy of Pediatrics (AAP), the American Academy of Pediatric Ophthalmology and Strabismus (AAOPOS), and the American Academy of Ophthalmology (1998) concluded that there is insufficient scientific evidence to support claims that academic abilities of children with learning disabilities can be improved with visual perceptual training.

Vision restoration therapy (VRT) targets the vision center of the brain and is intended to improve visual function in patients with visual field deficits that may result from brain injury or
stroke. Patients utilize a computer screen to focus on a displayed central point and respond every time they see light stimuli appear. The light stimuli are presented in the area most likely to recover visual function, an area that will change as therapy progresses and vision is improved. While there are studies evaluating the usefulness of VRT, there is inadequate evidence of effectiveness for this treatment.

Meuller et al (2003) performed a retrospective analysis of 69 patients with visual field deficits following neurotrauma or stroke after they had performed a 6 month regimen of VRT. Specifically, these researchers wanted to ascertain (i) if VRT affects activities of daily life (ADL) measures, and (ii) to what extent any subjective changes correlate with quantitative measures of visual field enlargements. A retrospective analysis was performed with data of 69 patients who had been interviewed after 6 months of VRT. Patient testimonials were analyzed post-hoc and correlated with demographic status as well as pre- and post-RT changes as measured by perimetric testing. As previously described, VRT significantly increased detection ability and most patients (88%) reported subjective benefits in ADL. A correlation analysis of quantitative parameters of visual field enlargements with subjective patient testimonials was performed. Significant correlation was found in the categories "carrying out hobbies" ($r = 0.360$) and for "general improvement of vision" ($r = 0.244$). A trend was evident for the category "reading" ($r = 0.215$). No correlation was found between visual field size improvements and "visual confidence/mobility" and "ability to avoid collisions". Thus, visual field size appears only to be one, surprisingly minor, factor among others (such as temporal processing) determining subjective vision in brain damaged patients.

Meuller et al (2007) evaluated the outcome of VRT in a large sample of clinical patients and studied factors contributing to subjective and objective measures of visual field alterations. Clinical observational analysis of visual fields was performed...
in 302 patients before and after being treated with computer-based VRT for a period of 6 months at 8 clinical centers in central Europe. The visual field defects were due to ischemia, hemorrhage, head trauma, tumor removal or anterior ischemic optic neuropathy. Primary outcome measure was a visual field assessment with super-threshold perimetry. Additionally, conventional near-threshold perimetry, eye movements and subjective reports of daily life activities were assessed in a subset of the patients. Vision restoration therapy improved patients' ability to detect super-threshold stimuli in the previously deficient area of the visual field by 17.2 % and these detection gains were not significantly correlated with eye movements. Notable improvements were seen in 70.9 % of the patients. Efficacy was independent of lesion age and etiology, but patients with larger areas of residual vision at baseline and patients over 65-year of age benefited most. Conventional perimetry validated visual field enlargements and patient testimonials confirmed the improvement in every day visual functions. The authors concluded that VRT improves visual functions in a large clinical sample of patients with visual field defects involving the CNS, confirming former experimental studies. The lack of a control group limited the validity of the findings of this study.

In a retrospective study, Romano and colleagues (2008) examined the effect of a visual rehabilitation intervention on visual field defects in a U.S. cohort. Vision restoration therapy consists of a specific pattern of stimulation that is directed at the border of the blind field. This study evaluated individuals with homonymous visual field defect from retrochiasmatic lesions treated with 6 modules of VRT. Supra-threshold visual field testing of the central 43 x 32 was obtained at baseline and after each module. The main outcome measures were the change in stimuli detection and the shift in the position of the border of the blind field. The impact of age, time from injury and type of visual field defect were analyzed. Among 161 patients, the mean absolute improvement in stimuli detection was 12.8 %. The average border shift was 4.87.
Improvements of greater than or equal to 3% was noted in 76% of patients. Absolute change in stimulus detection of greater than or equal to % at mid-therapy was associated with a greater final improvement. Age, time from lesion and type of visual field defect did not influence the degree of field expansion. The authors concluded that VRT improves stimulus detection and results in a shift of the position of the border of the blind field as measured on suprathreshold visual field testing. These results support prior reports and support VRT as a useful rehabilitative intervention for a proportion of patients with visual field defects from retrochiasmatic lesions. However, the findings of this study were limited by lack of (i) randomization, (ii) control group and (iii) long-term follow-up. In a pilot study, Jung et al (2008) evaluated the effects of VRT on the visual function of 10 patients with stable anterior ischemic optic neuropathy (AION). All patients were evaluated before VRT and after 3 and 6 months of treatment by Early Treatment Diabetic Retinopathy Study (ETDRS) visual acuity, contrast sensitivity, reading speed, 24-2 SITA-standard Humphrey visual field (HVF), high-resolution perimetry (HRP) (perimetry obtained during VRT), and vision-based quality of life questionnaire. Patients were randomized between 2 VRT strategies (5 in each group): (i) VRT in which stimulation was performed in the seeing VF of the affected eye ("seeing field-VRT"); and (ii) VRT in which stimulation was performed along the area of central fixation and in the ARV (areas of residual vision) of the affected eye ("ARV-VRT"). The results of the HRP, HVF, and clinical assessment of visual function were compared for each patient and between the 2 groups at each evaluation. Visual acuity qualitatively improved in the ARV-VRT group, however the change was not statistically significant (p = 0.28). Binocular reading speed significantly improved in the ARV-VRT group (p = 0.03). HVF foveal sensitivity increased mildly in both groups (p = 0.059); HRP analysis showed a similar increase in stimulus accuracy in both groups (mean improvement of about 15%). All patients reported functional improvement after VRT. The authors
concluded that despite a small sample, the study showed a trend toward improvement of visual function in the ARV-VRT group. Improvement of HRP in both groups may reflect diffusely increased visual attention (neuronal activation), or improvement of an underlying sub-clinical abnormality in the "seeing" visual field of patients with optic neuropathies. The author noted that a small sample size limited the conclusions that can be reached from this study.

Glisson (2006) noted that VRT has shown promise as a treatment strategy to improve visual field deficits in patients with lesions of the brain or optic nerve. However, objective measures of its effectiveness have remained controversial. The author reviewed the current theories supporting the reported benefits of VRT, and the dissenting opinions, reconsidered VRT as an emerging therapy. The benefits of VRT have been challenged by a study suggesting that no improvement exists with careful control of fixation. Alternatively, others suggested that eye movements are not induced by VRT. Functional imaging studies demonstrated the potential role of plasticity in VRT. While the exact mechanism remains to be elucidated, subjective improvement in daily functioning was reported in a significant percentage of patients. The author concluded that VRT is a non-invasive, home-based strategy for the rehabilitation of patients with visual field loss caused by structural or ischemic damage. While subjective benefits in functional status have been reported by patients following completion of the program, debate centered around the inadequacy of the methods used to document its effectiveness. Until such a method is validated by carefully controlled studies, subjective improvement in visual function stands alone as evidence of VRT's benefit.

McFadzean (2006) reviewed the controversial findings for NovaVision's VRT. It has been claimed that NovaVision's computerized therapy results in expansion of the visual field in optic nerve and occipital lesions, but the outcome has been challenged on the grounds of unsatisfactory perimetric control.
of central fixation and disputed mechanisms. The author noted that in clinical practice NovaVision's VRT should not currently gain acceptance in view of unacceptable perimetric standards and equivocal results. Possible effects on a relative scotoma at the edge of a lesion have not been adequately explored. In the interim, research should also be focused on compensatory eye movement strategies.

Astle et al (2011) noted that amblyopia presents early in childhood and affects approximately 3% of western populations. The monocular visual acuity loss is conventionally treated during the “critical periods” of visual development by occluding or penalizing the fellow eye to encourage use of the amblyopic eye. Despite the measurable success of this approach in many children, substantial numbers of people still suffer with amblyopia later in life because either they were never diagnosed in childhood, did not respond to the original treatment, the amblyopia was only partially remediated, or their acuity loss returned after cessation of treatment. In this review, these researchers examined if the visual deficits of this largely over-looked amblyopic group are amenable to conventional and innovative therapeutic interventions later in life, well beyond the age at which treatment is thought to be effective. There is a considerable body of evidence that residual plasticity is present in the adult visual brain and this can be harnessed to improve function in adults with amblyopia. Perceptual training protocols have been developed to optimize visual gains in this clinical population. Results thus far are extremely encouraging; marked visual improvements have been demonstrated, the perceptual benefits transfer to new visual tasks and appear to be relatively enduring. The essential ingredients of perceptual training protocols are being incorporated into video game formats, facilitating home-based interventions. The authors concluded that many studies support perceptual training as a tool for improving vision in amblyopes beyond the critical period. They stated that should
this novel form of treatment stand up to the scrutiny of a randomized controlled trial, clinicians may need to re-evaluate their therapeutic approach to adults with amblyopia.

Schinzel et al (2012) noted that there is a pilot study that examined if residual visual deficits after past or recent optic neuritis can be reduced by means of VRT. They stated that if VRT is shown to improve visual function after optic neuritis, this method might be a first therapeutic option for patients with incomplete recovery from optic neuritis.

**Body Dysmorphic Disorder:**

Beilharz and colleagues (2017) noted that recent advances in body dysmorphic disorder (BDD) have explored abnormal visual processing, yet it is unclear how this relates to treatment. These researchers summarized the current understanding of visual processing in BDD and reviewed associated treatments. The literature was collected through PsycInfo and PubMed. Visual processing articles were included if written in English after 1970, had a specific BDD group compared to healthy controls and were not case studies. Due to the lack of research regarding treatments associated with visual processing, case studies were included. A number of visual processing abnormalities are present in BDD, including face recognition, emotion identification, aesthetics, object recognition and gestalt processing. Differences to healthy controls include a dominance of detailed local processing over global processing and associated changes in brain activation in visual regions. Perceptual mirror retraining and some forms of self-exposure have demonstrated improved treatment outcomes, but have not been examined in isolation from broader treatments. The authors concluded that despite these abnormalities in perception, particularly concerning face and emotion recognition, few BDD treatments attempt to specifically
remediate this. The development of a novel visual training program that addresses these widespread abnormalities may provide an effective treatment modality.

Reading and/or Spelling Disorders:

Galuschka and associates (2016) noted that 3 to 11% of children and adolescents suffer from a reading and/or spelling disorder. Their poor written-language skills markedly impair their scholastic performance and are often associated with other mental disorders. A great deal of uncertainty still surrounds the question of the appropriate methods of diagnosis and treatment. These investigators systematically searched for pertinent publications in databases and literature reference lists, summarized the evidence in 6 tables, and examined some of it in a meta-analysis. Recommendations were developed in a consensus conference. A reading and/or spelling disorder should only be diagnosed if performance in these areas is below average. It should be examined if an attention deficit-hyperactivity disorder (ADHD), anxiety disorder, or disorder of arithmetical skills is also present.

Reading and spelling performance should be reinforced with systematic instruction about letter-sound and sound-letter correspondences, letter-syllable-morpheme synthesis, and sound-syllable-morpheme analysis ($g' = 0.32$) (recommendation grade A). Spelling ability responds best to spelling-rule training (recommendation grade A). Irlen lenses, visual and/or auditory perceptual training, hemispheric stimulation, piracetam, and prism spectacles should not be used (recommendation grade A). The authors concluded that evidence- and consensus-based guidelines for the diagnosis and treatment of reading and/or spelling disorders in children and adolescents are now available for the first time. Reading and spelling abilities should be systematically and comprehensively reinforced, and potential co-morbid disorders should be sought and treated appropriately. They stated that the effectiveness of many treatments now in use has not been documented; if they are to be used in the future, they must be
tested in randomized, controlled trials (RCTs). For adult
sufferers, adequate diagnostic instruments and therapeutic
methods are not yet available.

**Homonymous Hemianopia and Vision Restoration
Therapy:**

In a review on “Homonymous hemianopia and vision
restoration therapy”, Frolov and colleagues (2017) noted that
homonymous hemianopia from stroke causes visual disability.
Although some patients experience spontaneous
improvement, others have limited to no change and may be
left with a severe disability. Current rehabilitation strategies
are compensatory and cannot restore function. Animal studies
suggested that central nervous system plasticity could allow
for re-direction of lost visual function into undamaged areas of
cortex. A commercial therapy system was developed, from
which claims of visual field expansion were disputed by
independent researchers. The authors concluded that the
treatment remains controversial with seemingly contradictory
data being generated; continued research is underway to
demonstrate the (non-)efficacy of this treatment method.

**CPT Codes / HCPCS Codes / ICD-10 Codes**

Information in the [brackets] below has been added for
clarification purposes. Codes requiring a 7th character are
represented by "+":

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<th>Code</th>
<th>Code Description</th>
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<td>Visual restoration therapy:</td>
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<td>Other CPT codes related to the CPB:</td>
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<td>Code</td>
<td>Code Description</td>
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<tr>
<td>92065</td>
<td>Orthoptic and/or pleoptic training, with continuing medical direction and evaluation</td>
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<tr>
<td>97533</td>
<td>Sensory integrative techniques to enhance sensory processing and promote adaptive responses to environmental demands, direct (one-on-one) patient contact by the provider, each 15 minutes</td>
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ICD-10 codes not covered for indications listed in the CPB (not all-inclusive):

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<th>Description</th>
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<td>Specific spelling disorder</td>
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<td>H53.40 - H53.489</td>
<td>Visual field defects</td>
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<td>I65.01 - I66.9</td>
<td>Occlusion and stenosis of cerebral and precerebral arteries</td>
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<td>R48.0</td>
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<td>R49.0 - R49.9</td>
<td>Voice and resonance disorders</td>
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<td>R62.0</td>
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<td>Fracture of skull [neurotrauma]</td>
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<td>Z87.898</td>
<td>Personal history of other specified conditions [speech]</td>
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The above policy is based on the following references:


Amendment to
Aetna Clinical Policy Bulletin Number:
0321 Visual Perceptual Training and Vision Restoration Therapy

There are no amendments for Medicaid.