NEURO-OPTOMETRIC REHABILITATION ASSOCIATION
(International)

P.O. Box 1408
Guilford, Connecticut 06437
(203) 453-2222

NORA DEFINITION OF NEURO-OPTOMETRIC
REHABILITATION

Neuro-optometric rehabilitation is an individualized treatment regimen for patients with visual deficits as a direct result of physical disabilities, traumatic brain injuries, and other neurological insults. Neuro-optometric therapy is a process for the rehabilitation of visual/perceptual/motor disorders. It includes, but is not limited to, acquired strabismus, diplopia, binocular dysfunction, convergence and/or accommodation paresis/paralysis, oculomotor dysfunction, visual-spatial dysfunction, visual perceptual and cognitive deficits, and traumatic visual acuity loss.

Patients of all ages who have experienced neurological insults require neuro-optometric rehabilitation. Visual problems caused by traumatic brain injury, cerebrovascular accident, cerebral palsy, multiple sclerosis, etc., may interfere with performance causing the person to be identified as learning disabled or as having attention deficit disorder. These visual dysfunctions can manifest themselves as psychological sequela such as anxiety and panic disorders as well as spatial dysfunctions affecting balance and posture.

A neuro-optometric rehabilitation treatment plan improves specific acquired vision dysfunctions determined by standardized diagnostic criteria. Treatment regimens encompass medically necessary noncompensatory lenses and prisms with and without occlusion and other appropriate medical rehabilitation strategies. © 1992
RODERICK FIELDS, OD
NEURO/OPTOMETRIC REHABILITATION

REFERRAL GUIDE FOR NEURO-OPTOMETRIC REHABILITATION

1. Binocular Vision Difficulties (uncoordinated eye movements)
2. Accommodative dysfunction (focusing problems)
3. Convergence insufficiency (difficulty moving visual fixation inward toward nose)
4. Ambient vision function (confusion in a busy visual environment, like the mall)
5. Spatial disorientation (difficulty organizing visually presented materials)
6. Ocular motor dysfunction (inaccurate pursuit, or saccadic eye movements)
7. Diplopia (double vision)
8. Poor visual concentration or poor visual attention
9. Asthenopia (eye strain)
10. Visual distortion (things seem to move or distort in shape)
11. Headaches when reading or during other visually directed tasks
12. Blurred vision
13. Squinting
14. Photophobia (light sensitivity)
15. Loss of place when reading
16. Loss of visual awareness to one side (hemianopsia)
17. Visual memory problems
18. Nystagmus (rapid oscillating side to side eye movements)
19. Poor visually directed balance (extension, flexion or weight shift)
20. Depth perception problems
21. Inaccurate eye-hand/eye-foot coordination
22. Slow reaction time to visual stimuli
23. Visual-Perceptual problems (e.g. form perception, figure-ground, etc)
24. Dizziness / visual-vestibular dysfunction.

Restgui4neuro.doc revised 11/00
RODERICK FIELDS, OD  
NEURO/OPTOMETRIC REHABILITATION

POST TRAUMA VISION SYNDROME

The Post-Trauma Vision Syndrome is a disruption of the ambient visual process, causing difficulty with accommodative function, binocular fusion, fixation ability, and visual-spatial organization. MRI findings are usually negative in closed head injury. The injuries suffered are most often diffuse and are caused by shearing and stretching of the brain fibers, as well as the neurotoxic cascade induced by the injury.

CHARACTERISTICS

- Binocular Vision Difficulties (Exotropia / Exophoria and less often Esotropia / Esophoria)
- Accommodative Dysfuction
- Convergence Insufficiency
- Change in Blink Rate
- Spatial Disorientation
- Poor Fixations and Pursuits (Ocularmotor Dysfunction)
- Unstable Ambient Vision
- Increased Myopia (Due to High Focal State of Regard)

SYMPTOMS

- Blurry Vision
- Diplopia
- Objects Appear to Move
- Poor Visual Concentration and Attention
- Staring Behavior
- Asthenopia
- Associated Neuromotor Difficulties
  - Balance
  - Coordination
  - Posture
- Photophobia (Due to an Over-Stimulated Focal Visual System)

TREATMENT

- Neuro-Optometric Rehabilitation may include the design and prescription of therapeutic and/or compensative lenses or prisms, selective occlusion, neuro-optometric rehabilitative vision therapy, and other medically necessary visual modalities and strategies to enhance and/or rehabilitate disrupted visual function, and to re-establish a more normal ambient-focal vision relationship.

Rev. 12/20/01 visyndrm.tbi.doc
Many patients who have had a stroke, traumatic brain injury, or other neurological insult experience a somatic and visual shift in their concept of midline. The shift may be lateral, anterior or posterior and is usually in the direction away from the affected side.

When the visual midline shifts, it causes the person to unconsciously think that the body center is shifted in the direction of the visual midline. In turn, the person will lean toward the midline shift. This can cause problems with balance, center of gravity, weight bearing, transfer or ambulation.

For example, if a hemiparesis or hemiplegia has occurred, a lateral shift in visual midline may cause the patient to posture laterally away from the affected side. Some patients may have an anterior visual midline shift causing a forward lean (flexion), or a posterior midline shift, causing a backward lean (extension).

When a patient develops a visual midline shift, then physical therapy or occupational therapy treatments for balance, transfer or ambulation may plateau.

Yoked prism glasses are prescribed by optometrists skilled in neuro-optometric rehabilitation for patients with midline shift. Yoked prisms alter a patient’s perception of visual space and increase the patient’s ability to transfer their weight to achieve better posture and balance. These therapeutic prism lenses are not compensatory in nature and are usually prescribed for short periods of time each day, in conjunction with physical and/or occupational therapy.

The initially prescribed power and direction of the yoked prism is only a starting point. As a result a higher or lower powered prism may be needed depending on the patient’s response to the prism and on the level and intensity of therapy. Sometimes the direction of the yoked prism needs to be changed as therapy progresses.

The therapist keeps the prescribing optometrist informed about the patient’s response to the prescribed yoked prism during therapy sessions.

During treatment with a yoked prism the patient must maintain visual fixation at a distance of at least 10 to 15 feet away (while being spatially aware of the visual environment). This allows more effective response to the spatial changes induced by the yoked prism.

The patients muscle tone, fatigue level and cognitive awareness while fixating plays an important role in the effectiveness of the yoked prism treatments. In many cases, the full potential of physical and/or occupational therapy can be reached more quickly when yoked prisms are used.

Prescribed yoked prism lenses have been used effectively for many years at Neuro-Optometric Rehabilitation Programs in hospitals and rehabilitation centers throughout the United States.

Symptoms of Visual Midline Shift Syndrome:

* Dizziness or nausea
* Spatial disorientation
* Consistently stays to one side of hallway or room
* Bumps into objects when walking
* Poor walking or posture; leans back on heels, forward, or to one side when walking, standing or seated
* Perception of the floor being tilted
* Associated neuromotor difficulties with balance, coordination and posture.
OPTOMETRIC CONTRIBUTIONS TO THE OVERALL REHABILITATIVE PROCESS

"FEW BRAIN INJURY REHABILITATION FACILITIES REGULARLY PURSUE REHABILITATIVE OPTOMETRIC EVALUATIONS. CLEARLY OUR STUDY INDICATES THE DESIRABILITY, IF NOT THE URGENCY, OF CHANGING THESE PRACTICES." - Gianutsos, et al

- Visual Deficits following brain injury are the least diagnosed and many times the most treatable dysfunction.

- Studies have shown that there is a significant correlation between levels of independence and ocular pursuits, visual attentiveness, position in space, body scheme, figure-ground and form perception.

- The optometrist can significantly contribute to the overall effectiveness of the rehabilitation process for patients with head trauma and other neurological deficits.

1. Evaluate the patient's visual abilities and the effect that visual deficits are having on the quality of the patients life.
2. Many of the tests used by the rehabilitation team members are dependent upon the function and efficiency of the visual system as it affects the input and output of the information to the brain and motor system.
3. Incorporation of information on the function and efficiency of the visual system into the total treatment plan will add to the overall progress of rehabilitation. The optometrists can also direct and incorporate effective treatment modalities into the interdisciplinary treatment program.
4. The prescribing of optical lenses, filters, prisms and other optical devices can have an immediate and positive effect on the patients performance and benefit that the patients receives from the interdisciplinary treatment program.
5. Optometric Vision Therapy for the treatment of oculomotor, accommodative and binocular dysfunctions, as well as treatment for deficits in visual-motor integrative and visual information processing dysfunctions can have a very positive effect of the patients' level of functioning and quality of life.