



Vision Alert

April 2003

Computer Vision Syndrome

"Computer Vision Syndrome" (CVS) effects 60 million Americans, resulting in reduced workplace productivity by almost 10% and accuracy by 38% according to recent studies. The CVS Information Center (www.cvseyeinfo.com) estimates that costs incurred secondary to CVS in the United States exceed \$2 billion each year!

Computer Vision Syndrome is described as a cluster of eye and vision signs and symptoms including: blur, headache, double vision, eye strain, fatigue and reduced performance associated with prolonged use of computers in the workplace, in school, and at home. A variety of vision skills are involved with prolonged near point activity associated with computer use.

Accommodation is the term describing the near point focusing mechanism. Sustained and accurate accommodation is required for computer vision performance. Problems in accommodative function include:

- **Accommodative insufficiency** or the inability to maintain accurate sustained near point focus; and
- **Accommodative infacility** or a deficiency in the ability to accurately and efficiently shift focus between distance and near objects of regard.

Binocularity refers to the use of the two eyes together as a team. This skill requires alignment of the muscles of each eye so that the two eyes point at the same location in space and at the appropriate working distance. Deficiencies in binocular function include among others:

- **Convergence insufficiency** or poor ability to converge the two eyes together for close object viewing; and
- **Convergence excess** where the two eyes over-converge or point at a location in space closer than the object of regard.

Problems in refractive correction (i.e. prescription glasses) such as improperly corrected myopia (nearsightedness), hyperopia (farsightedness), and astigmatism can also contribute to Computer Vision Syndrome.

Diagnosis of Computer Vision Syndrome is based on a subjective interview by your eye doctor at NSVC and following a comprehensive evaluation of those vision skills involved with CVS. Your NSVC doctor will simulate the work environment as closely as possible during the examination procedures. It actually is very helpful for you to evaluate your work environment prior to your examination. Having information available such as working distances, print sizes, lighting conditions, etc. will further assist your doctor in determining the best method of treatment.



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Treatment of Computer Vision Syndrome targets three general areas:

- Work environment/ergonomics.
- Prescription eyewear (glasses, contact lenses, etc.) specific to the demands of the computer work place.
- Vision Therapy to improve certain vision skills that may contribute to CVS.

Ergonomics

In the computer workplace various modifications in the physical environment can go a long way to alleviating symptoms associated with CVS. Some things to consider include: glare and reflection free computer screens, adjustable contrast and brightness settings on the screen, working distance from the eyes to the computer screen ranging between 12 and 30 inches depending on the size of the screen (large screens require further working distances), and making sure that back, hand, and foot posture is appropriate (see diagram of proper ergonomic computer posture). An important fact to keep in mind is that blink rates decrease while people work on computers. This often results in symptoms of dry eye associated with prolonged computer use. Consider the use of artificial tear drops and lubricants or, in more severe cases, prescription medications or punctal occlusion therapy.

Computer Glasses

A variety of spectacle lens designs have been developed to assist in the treatment of Computer Vision Syndrome. The key initial factor is the determination of the appropriate prescription lens power for the individual patient. In addition to lens correction of refractive errors as mentioned previously, "prism" power can be incorporated into spectacle lenses to improve binocular function. Your doctors and opticians at NSVC have found that specially designed "computer glasses" often make dramatic improvements in computer performance. The incorporation of specific lens tints and coatings also are effective. In some cases contact lenses also may play a role in the management of CVS.

Vision Therapy

Vision Therapy (also known as "orthoptics" and eye exercises) can be extremely effective in the treatment of Computer Vision Syndrome in cases where contributing vision skills such as binocular and accommodative dysfunction are involved.

Dr. Darin Strako, Director of Pediatric Eye Care, Binocular Vision and Vision Therapy Services of North Suburban Vision Consultants states that, "The numbers of individuals that suffer from CVS is overwhelming. We have the ability to diagnose and treat CVS very successfully. Our task now is to educate the public about this problem and to provide the appropriate professional care for those afflicted."