

DOCTOR ERGO & CVS DOCTORS MEETING THE EYE CARE NEEDS OF COMPUTER USERS

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Abstract

Vision and eye problems at computers are widespread and have become known as Computer Vision Syndrome (CVS). Symptoms include eyestrain, blurred vision, dry eyes, irritated eyes, eye fatigue, neck ache and backache. Symptoms can result from vision and eye disorders and/or from environmental disorders. Treatment often requires more critical testing of vision than is commonly performed in today's health care environment and also can require diagnosis and treatment of various aspects of the work environment such as lighting, reflections and workstation arrangement. The eye doctor does not have access to the patient's work environment nor does s/he usually have expertise in analyzing such. Two web-based services, one for computer users and one for eye doctors have been established to meet the eye care needs of computer users. Computer users can perform a self-assessment of their workstation environment and vision needs at www.DoctorErgo.com. A report of the self-analysis is given to the computer user and can be provided to the eye doctor. CVS Doctors is group of doctors with special commitment to treating CVS. The services of these doctors are made available to computer users from www.DoctorErgo.com. Eye doctors can join CVS Doctors at www.CVSDoctors.com.

Keywords

vision, computers, computer vision syndrome, eyestrain, web-sites

Nearly every computer user is aware that vision and eye problems are common among computer users – in fact, what has come to be known as “Computer Vision Syndrome” (CVS) is the most common health related problem among computer users. The eye-related problems most frequently include eyestrain, blurred vision, dry eyes, irritated eyes, eye fatigue, neck ache and backache. A recent phone survey¹ of more than 4,000 US adults aged 19 and over showed that 24.8% worked four or more hours/day at a computer and that 41% of them have symptoms related to CVS. Some 38 million people in the US meet these criteria.

Another way to quantify the problem is that 14-17% of optometric patients have a chief complaint related to working at a computer.^{2,3} This is a significant portion of general eye care practice. Projection to the annual number of eye examinations in the US calculates that 15 million eye examinations are given annually because of CVS and that \$1.75 billion are spent on those examinations and special computer glasses.

I have had an interest in CVS for quite some time, having established a Computer Vision Clinic at the UC Berkeley School of Optometry (UCBSO) in 1985.⁴ Subsequently I have spent a considerable portion of my career treating patients with vision and eye-related problems at computers. I have sought to develop an academic basis⁵ for such treatment by writing and lecturing to my colleagues about the issues. I have found that the problems of CVS are nearly always treatable. For nearly every patient there is a diagnosable vision problem, an environmental disorder or a combination of the two that is

causing the problems. Treatment is usually successful.⁶

However, as a whole, optometrists are significantly less certain of their diagnosis and management of CVS patients compared to other patients. A survey of more than 1,000 optometrists² showed they are uncertain of their diagnosis and management in 14.1% of most patients, but they are uncertain for 20.9% of their CVS patients. This difference is highly statistically significant ($p < 10^{-13}$).

I suggest two main reasons that optometrists are less confident about management and treatment of CVS patients.

1. Diagnosis and management of CVS patients often requires more rigorous diagnosis and testing than is typically performed for routine patients. Work at a computer is very visually demanding, therefore many marginal eye and vision disorders can cause problems for computer users. Conditions such as disorders of accommodation or binocular vision commonly cause problems for computer users. However, many eye doctors do not adequately test these areas or they don't consider marginal findings as clinically significant. Another condition that must be more aggressively diagnosed for computer users is dry eyes. Also, many presbyopic computer users require glasses with a different lens design or prescription than their general wear glasses.
2. The computer work environment can significantly contribute to or completely cause the symptoms. Environmental features such as lighting, reflections, equipment location, posture and display quality are impor-

tant for optimal visual performance and comfort. However, the eye doctor typically does not have access to the patient's environment nor are they necessarily trained in environmental analysis. Table 1 summarizes the major causes of CVS.

Table 1.
The most common reasons for CVS

Vision and Eye Factors	Environmental Factors
Refractive Error	Lighting Arrangement
Binocular Vision Disorder	Screen Reflections
Accommodative Disorder	Monitor Location
Dry Eyes	Workstation arrangement
Presbyopia	Display Quality
Spectacle Design	

No single treatment, either visual or environmental, can resolve every computer user's problems, although some distributors of products or methods seem to claim otherwise. However, there is nearly always one or more vision or environmental disorder for any given patient. The key to solving the problem is to first identify the particular disorder(s) and then implement the appropriate treatment(s).

Ergonomists, human resources managers, safety personnel and computer users often ask, "How can I find an eye doctor who can solve my problem?" The question indicates they either don't have confidence that their current eye doctor can solve their problem or that they understand some eye doctors are capable of managing this problem better than others. I think they are correct. Many eye doctors do not adequately examine functional aspects of the visual system and/or do not provide proper spectacle designs for the specific needs at computers. Also, eye doctors are generally not well trained in ergonomics and therefore not equipped to analyze and treat the work environment.

Using web-sites to help treat CVS

Resolving the symptoms of CVS is not necessarily difficult. The problems are that both computer users and eye doctors need more information about how to treat the eyes, the visual system and the work environment in order to resolve the symptoms. To address these problems I have

developed programs that use web-sites as the main communication and organizing vehicle.

In September of 1999 I launched www.DoctorErgo.com (for consumers) and www.CVSDoctors.com (for eye doctors) with the following objectives:

1. To provide computer users with self-help information about their work environment and eyes at computers.
2. To provide advanced education for eye doctors in the diagnosis and management of CVS.
3. To provide a mechanism by which eye doctors can have an analysis of the patient's work environment.
4. To help computer users identify eye doctors with interest and/or expertise in managing CVS.

Doctor Ergo (www.DoctorErgo.com) – for computer users (Figure 1)

The Doctor Ergo web-site contains categorical information for computer users concerning the eyes and visual system as well as about the work environment. This helps the user to understand various aspects of their eyes, how they are used at the computer, and what can go wrong to cause symptoms. This also helps the computer user understand key aspects of the work environment such as lighting, reflections, work location, etc. Very often computer users can make simple changes in their work place to significantly improve their comfort.

A special feature of the Doctor Ergo web-site, and the most frequented area of the site, is an eight-step CVS test in which users make measurements and answers questions about their symptoms, their work station arrangement and their eyes. After taking the test, the answers are analyzed and a report is generated for the patient. This test and report help the users identify their specific symptoms, decide if they would likely benefit from an eye examination, evaluate various aspects of their work environment, and suggest improvements in their work environment where indicated.

Users are encouraged to print the report and bring it to their eye care practitioner in order to provide her with an assessment of the work environment to assist in evaluating the patient.

A key element to solving CVS is to have a thorough eye and vision examina-



tion by an eye doctor who is dedicated to providing care that is appropriate to the problem. If the visitor to Doctor Ergo does not have an eye doctor and/or wants to find one with special interest and/or training in resolving CVS, she can use the doctor locator on Doctor Ergo to find one. The doctors who are listed in the doctor locator are members of CVS Doctors – which brings us to the second web-site.

CVS Doctors (www.CVSDoctors.com) - for eye doctors

CVS Doctors is a professional group of eye doctors committed to relieving the vision and eye-related problems of people who work at computers or other visually intensive tasks. Member doctors have each demonstrated particular interest in solving CVS and have pledged to work towards resolving the symptoms of CVS. Member doctors are listed in the doctor locator at the Doctor Ergo site.

There are two membership levels in CVS Doctors: Associate and Full Member. Full members are listed first in the doctor locator on the Doctor Ergo web-site, Associate Members are shown if the user chooses to expand the first search they perform.

Eye Doctors become associate members by registering at:

www.CVSDoctors.com.

To register, doctors must agree the CVS Doctors' Mission Statement and the CVS Doctors' Oath. These statements acknowledge the unique diagnosis and treatment aspects of CVS as well as the environmental causes of CVS (See Table 2).

Table 2.
The Mission Statement and Oath to which Associate and Full Members of CVS Doctors agree.

CVS Doctors Mission Statement

The mission of CVS Doctors is to relieve the vision and eye-related problems of people who work at computers or other visually intensive tasks. The doctors in this group recognize that, because of the high visual demands of such tasks, diagnosis and management of these patients may require specialized testing and/or treatment. CVS Doctors are individually committed to solving the particular needs and problems of their computer using patients.

CVS Doctor Oath

*Whereas, many tasks performed on computers, whether for work or recreation, require extended and/or demanding use of the eyes and vision, and
 Whereas, many people who use computers experience vision or eye symptoms as a result of their interaction with a computer or other visually intensive tasks, and
 Whereas, the etiology of such symptoms can be from diagnosable eye and vision disorders and/or from various factors in the computer environment, and
 Whereas, diagnosis and management of the eye and vision disorders and/or diagnosis and management of aspects of the work environment can alleviate the symptoms, and
 Whereas, management of the patient with eye and/or vision symptoms from computer use may require expanded case history, examination and treatment options than for other patients,
 Therefore be it resolved that
 I am committed to alleviating the eye and vision symptoms of my computer using patients and
 I will endeavor to enhance my understanding of the unique visual needs of my computer using patients and
 I will utilize the diagnostic and management procedures, protocols and techniques that, in my professional judgment, meet the unique and specific needs of my computer using patients.*

Table 3.
Full members of CVS Doctors meet an educational requirement and also agree to these diagnostic and management principles.

Diagnostic and Management Principles of CVS Doctors:

I will determine for every patient whether they have computer-related symptoms and/or special visual requirements for computer activities.

I will screen for binocular vision disorders, accommodative disorders, dry eyes and work environment disorders on all computer-using patients, and will perform in-depth testing when indicated by the screening tests.

I will perform in-depth testing for accommodative and binocular disorders for all computer-using patients when indicated by screening or patient symptoms and treat when indicated.

I will perform in-depth testing for dry eye for all computer-using patients when indicated by screening or patient symptoms and treat when indicated.

For all computer-using patients with visual or ocular discomfort I will seek to identify workplace factors contributing to or causing said symptoms and suggest improvements when indicated.

For each computer-using patient I will consider whether a unique optical prescription or lens design (e.g. occupational lenses) will benefit the patient and prescribe such when indicated.

For any third party programs that I accept and that provide special "computer glasses," I will rigorously apply the program criteria to determine if the prescribed glasses or care are covered.

Doctors become full members of CVS Doctors by meeting an educational requirement and by agreeing to a set of diagnostic and management principles. The educational requirement can be met by passing six hours of continuing education (approved for CE by the University of Alabama at Birmingham School of Optometry) downloaded from:

www.CVSDoctors.com

or by attending an approved eight-hour seminar on CVS. Table 3 specifies the diagnostic and management principles by

which Full Member CVS Doctors agree to practice.

The goal in developing CVS Doctors is to create a cadre of doctors who give advanced care to computer users – a group of doctors that can be recommended from the doctor locator at Doctor Ergo or who can serve as a panel to provide corporate eye care. By agreeing with the Mission and Oath, Associate Members give assurance that they acknowledge the primary causes and treatments of CVS and commit themselves to diagnosing and managing those disorders. By obtaining specific education and agreeing to the more specific Diagnostic and Management Principles, Full Members give greater assurance of meeting the needs of computer users.

Consistent with the above goal, doctors are encouraged to become full members. This encouragement is primarily in the form of additional benefits offered to Full Members. Both Associate and Full Members have password access to considerable technical and clinical information on www.CVSDoctors.com, but full members also have access to patient forms that can be downloaded from the site as well as forms and information for workplace consulting.

A primary benefit of full membership is preferred listing from the doctor locator at Doctor Ergo. Only Full Members are listed on the first search. After the first search, the visitor can perform an expanded search that shows Full (in bold print) and Associate Members. Other benefits of Full Membership include direct links to their office web-site, listing of multiple practice locations and participation in group governance and direction.

Status

More than 100,000 visitors have been to www.DoctorErgo.com in the first six months of this year. The most visited area of the web-site is the CVS self-diagnostic test. Volume is likely to continue to grow as more people learn of its availability. Since its inception in September 1999, more than 700 eye doctors have joined CVS and approximately 100 have become Full Members. The participation levels at the two web-sites are strong indications they are meeting the needs of both computer users and eye doctors.

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