Close your eyes for a moment and visualize your business operating without computers. Hard to imagine, isn’t it? Unquestionably, computers have become ever-present tools in our offices, and as the Internet has grown, we have found ourselves spending more and more time staring at our computer screens well beyond office hours.

Nearly 150 million people in the United States work on a computer every day, and it is estimated that close to 90% of them experience computer eyestrain. While mass computer expansion at home and in the office has provided a big boost to global communications, computers have and will continue to take a toll on our eyesight. In fact, occupational health experts agree that the source of today’s top vision complaint in the workplace is the computer monitor.

“Eyestrain is a common problem for adults who spend four hours or more each day concentrating on a computer screen,” says optometrist Kent Daum from the University of Alabama School of Optometry in Birmingham. “Even short, 25-minute periods can cause some eye discomfort.”

In addition to eyestrain, many computer users complain of tired, burning, itching, dry and/or watery eyes; headaches, double vision and afterimages; photophobia (sensitivity to light); pain in the eyes; or excessive blinking or squinting due to computer terminal work.

**Computer Vision Syndrome**

James Sheedy, O.D., Ph.D., coined the phrase “Computer Vision Syndrome” (CVS) in reference to these myriad ailments. The American Optometric Association reports that approximately 14% of patients schedule eye examinations as a result of CVS, and many others who suffer from CVS are not even aware that they have it. CVS is the most common repetitive stress injury brought about by video display terminal (VDT) work, even though CVS isn’t as famous as some other computer-related conditions, such as the musculoskeletal disorder carpal tunnel syndrome.

The cost for medical treatment and lost productivity associated with vision-related disorders among VDT users is believed to exceed $2 billion annually. Workers with computer-related vision problems are usually less efficient on the job and experience higher error rates as the day progresses. Research cited in the Journal of the American Optometric Association reported that only a small amount of visual interference, such as glare, reduced employee efficiency by as much as 19 percent.

**VDT Issues**

Jesse Rosenthal, O.D., MPH, and Mort Soroka, Ph.D., in their highly acclaimed book, Managed Vision Benefits, cite the following critical areas of concern that are characteristic of interfacing with computer/video display terminals.
Illumination
This relates to the work environment. Unlike other office equipment, computer screens are self-illuminating and made of glass. Therefore, there is potential for flickering or unclear characters caused by surrounding light sources. Poor contrast, poor resolution, glare and reflections on the screen can exacerbate CVS symptoms.

Visual Intensity
There is a particularly high level of intensity required for many computer tasks, particularly data entry, information retrieval or programming. These jobs require continual, uninterrupted activity at a computer station. Under these conditions, the eye’s focusing mechanism is more vulnerable to fatigue, making the proper eyeglass prescription essential.

Interaction and Focal Distance
Conventionally, reading materials are held 12 inches to 18 inches from our eyes, and doctors typically prescribe reading or "near vision" prescriptions for that range. However, computer stations are usually situated with the VDT screen 20 inches to 26 inches from the user. Therefore, many people require a special lens prescription to help them focus clearly at these distances for extended periods.

Screen Heights for Bifocal and Trifocal Wearers
In these corrections, the prescription for close tasks is set into the lower portion of the lens. While reading, we generally lower our eyes and automatically look through the bifocal or trifocal for clear focus. VDTs, however, are set relatively high, at or near eye level. As a result, bifocal and trifocal wearers may require special lenses to function effectively and efficiently at computers.

More jobs are becoming dependent upon lengthy hours working at a VDT, which can take a toll on employees’ eyes and physical well-being. Employees who work for extended periods at a computer and believe they are in need of corrective lenses for their VDT work should have a comprehensive eye examination. Some employers have set a prescribed period of work time at a terminal as their qualification for VDT vision coverage. The corrections that will help reduce eyestrain may very well also take care of neck, back and other muscle aches because the employee will be positioned more comfortably.

If there is an existing standard vision care employee benefit, the special testing can be performed in conjunction with the regular eye examination. This ensures convenience for the employee, while providing maximum cost-effectiveness by avoiding duplication of services.

Rosenthal and Soroka emphatically agree that computer users’ eyesight requires additional testing. It has been shown that “task-specific” eyeglasses can decrease visual complaints. Eyeglasses that are specifically suited for working with a computer display must differ significantly from an employee's regular eyewear. Rosenthal and Soroka suggest the following guidelines for occupational eyeglasses and spectacle prescriptions:
- prescription difference of at least .50 diopter
- different lens type, such as single vision versus bifocal
- height difference of at least 5mm on the bifocal segment of the finished lens (for workers over 40, it is important that the height of their bifocal segment match the screen height)
- a tint of 10 percent to 20 percent in gray or pink

Eyestrain Rx
In addition to the solutions set forth by Rosenthal and Soroka, the following suggestions may be of value:

1. Greater hertz or frequency of the monitor's screen will reduce the flicker in the screen. In addition, the higher the pixel count of the monitor's screen, the better the resolution, resulting in enhanced reliability. Resolutions of at least 110 pixels per inch are recommended.

2. Glare from lights reflecting off the screen will lower the contrast, thus forcing the eyes to work harder. A glare-reduction filter can reduce this potential problem significantly. One bearing an American Optometric Association seal of approval is recommended.

3. Adjustable work stations allowing for appropriate placement of the computer screen at angles 10 degrees to 20 degrees (slightly below eye level) are most comfortable. Also, a monitor on a base that swivels will reduce unnecessary head and eye movements.

4. Ergonomically designed chairs and keyboards, and proper ambient illumination, can provide additional relief. The keyboard, screen and copy should all be as close to equal distances from the eyes as possible. Workstation lighting should be shaded to avoid reflections on the monitor. Typical office lighting was designed for working on paper on a flat desk surface, and is actually twice as bright as the optimal lighting conditions for computer work.

Time and again, VDT vision plan benefits are providing mutually beneficial for both employers and employees. These programs have helped employees see more clearly, relieve eyestrain and fatigue, avoid headaches and work more accurately and efficiently. In a study of employees in New York State where a VDT vision program was implemented, 94 percent experienced improved comfort and resolution of their symptoms, and 82 percent reported improved quality or efficiency of work with the use of their occupational eyeglasses.

Studies continually show us that it is in the financial interest of the employer to assist in the provision of these services. It is not a costly benefit, and it adds directly to the bottom line by bringing greater comfort and increased productivity to employees.