

**SCREENS, PHONES, TABLETS AND MORE:
KEEPING YOUR EYES SAFE IN A DIGITAL AGE**



We are living in an extraordinarily digital age. Thanks to technology often small enough to hold in one hand, we can video chat across oceans, stream lectures online to thousands and read entire books on one screen. It's all shaping the way our world works, learns and socializes.

But this digital world poses a potential risk to our eyes.

In a 2012 survey conducted by The Vision Council, more than a third of U.S. adults reported spending four to six hours a day with digital media or related electronic devices. Fourteen percent pegged their total at 10 to 12 hours per day.

Children are mirroring their parents' behaviors, spending unprecedented amounts of time in front of digital technology. Studies suggest that children are now a leading impetus for purchases of consumer electronic products.ⁱ

As digital use increases among all ages, eye care providers are becoming ever more concerned about the potential short and long-term impact.

The issue is digital eye strain, which is caused by the overuse of digital devices. Because computer tablets, smartphones and other hand-held products are designed for reading and close range use, eyes must constantly refocus and reposition to process content like graphics and text. Over time, such efforts can lead to fatigue, irritation and vision problems.

For many Americans, digital eye strain is a product of their lifestyle. Thirty-four percent of adults are in professions that require prolonged use of digital devices. And the eyes feel it. Digital eye strain is the most common computer-related repetitive strain injury, surpassing carpal tunnel and tendonitis.

This technology won't be going away. So it's time to consider strategies and products to help lessen the problem.

To begin the conversation, The Vision Council sponsored this report on the incidence of digital eye strain among adults in this country. It suggests tips for how we all can reduce the risk to our eyes.

Working in the optical industry, I have seen a rising need for computer eyewear. Demanding office hours and technological advances have increased the amount of time my patients are spending in front of digital devices. But the daily grind is exhausting on more than just the mind; it strains and fatigues eyes.

The Vision Council is working to educate more adults about digital eye strain and how to relieve discomfort. We understand that technology is an important tool for many and digital habits aren't likely to change anytime soon. What we can do, however, is learn how to safely utilize these kinds of devices while still protecting eyes.

-Raanan Naftalovich

*Vice Chairperson,
Board of Directors of
The Vision Council*



What are Digital Media?

Digital media are forms of electronic content that can be transmitted through television, the Internet or computer-based networks. This content includes text, audio, video and graphics. Most digital media are based on translating analog data into digital data.

High-definition televisions, desktop and laptop computers, smartphones, e-readers, tablets and gaming systems are among the most popular digital media devices used today.

Looking at the Problem

For all of the special capabilities and uses they offer, digital media devices have a decided downside. After spending two or more hours looking at a computer, tablet or phone, many individuals experience dry eyes, blurred vision, irritation, eye fatigue, headaches, and neck and back pain. One or more of these symptoms may signal digital eye strain.

Digital eye strain is not permanent, but the discomfort is cause enough for concern. A 2012 survey by The Vision Council found that nearly 70 percent of U.S. adults experience some form of digital eye strain while using their electronic devices. According to eye care experts, the problem is twofold: the physical properties of technology are demanding on eyes and many people use devices in a way that can increase discomfort.

Digital Media Content

Unlike the solid lines and shapes that define print text and images, digital content is created by thousands of tiny pixels. When compact, pixels form sharp, clear content, but when spaced far apart they create fuzzy, distorted graphics. This distortion, which can cause undue stress and strain on the eyes, is called pixilation. Pixilation can result from internal issues such as outdated software, old equipment or incorrect resolution settings, or it can result from external issues including poor design, signal interference, or low resolution photographs or artwork.

Font styles can also affect eye comfort. Modern fonts with rounded, less-defined characters are much harder for eyes to bring into focus, thereby giving the eyes one more job to do.

Personal Device Use

For some, digital eye strain occurs simply because digital devices are used improperly.

The proximity and position at which we view electronics is one of many common problems. Larger electronics like computers and televisions should be positioned directly in front of or just below eye level so that the viewing angle does not exceed 35 degrees. This can help to prevent aches and pains caused by looking too far up or down at a screen.

When sitting at a desk, position the computer monitor or laptop at about an arm's length away from the eyes. This middle range can help to prevent unnecessary fatigue due to squinting or continually repositioning the head and neck to accommodate prescription glasses. Even at the correct viewing distance, eyes can dry and struggle to shift away from what is called a resting point of accommodation or RPA.ⁱⁱ An RPA is a dark focal spot that lies just beyond the computer screen.

Since eyes are naturally drawn to it, they must repeatedly readjust and reposition to maintain proper focus on a screen. Think of doing this for two, six, even 10 hours at a stretch and it is understandable that eyes tire and digital eye strain sets in.

Distance is also important when considering how to use smaller, handheld devices. Digital eye strain may occur from holding smartphones, cell phones and computer tablets at close range to eyes. A 2011 study by the State University of New York College of Optometry found that people hold mobile phones 2 to 9 inches closer to their eyes – on average – than they hold printed materials like newspapers, books and magazines. Such close range may help an individual see the text better, but it can cause eye irritation, strain and pain.ⁱⁱⁱ

Devices themselves can cause users to experience digital eye strain. Many electronics are now made with LED (Light-Emitting Diode) technology which releases a form of bright, blue light. Blue light has become especially desirable given its efficiency and power. But because of this intensity, blue light can cause eye strain. When blue light hits the eye lens, it refracts and causes other objects in surrounding view to go in and out of focus. To correct this issue, individuals often overcompensate by squinting, which results in eye fatigue.

Prescription Eyewear

Digital device use can also exacerbate discomfort in people with existing vision problems like latent eye muscle imbalance, astigmatism, farsightedness and presbyopia (often treated by using reading glasses, bifocals, or progressive lens glasses). For these adults and children, eyes are tasked with both processing digital content and correcting it.

A study from the University of Pennsylvania found that adults with prescription contact lenses and eyeglasses are more likely to experience symptoms of digital eye strain, including eye, neck and back pain.^{iv} Experts attribute this to use of prescription eyewear not specifically designed for the computer. Bifocal, trifocal and progressive lenses, for example, are not typically created for the mid-range distance of a computer. For individuals with low vision, in addition to those who spend the majority of their day in front of a computer, a separate pair of prescription eyeglasses should be worn while using digital devices.

As the issue of digital eye strain becomes more widespread, eyewear professionals can assist in fitting each individual with eyeglasses that are appropriate for their digital needs. Computer lenses can be created for making the use of digital devices more comfortable for the eyes. When visiting an eyecare professional regarding computer eyewear or digital eye strain, it is a good idea to arrive prepared: measure (or have someone measure) your eye-to-screen distance; bring in your digital device to demonstrate your body position while you use it; make a log of the approximate number of hours per day you spend in front of digital media; and create a list of specific symptoms of digital eye strain that affect you personally. These items will assist your eye care professional in meeting your individual needs to reduce or eliminate your eye strain.

Symptoms of Digital Eye Strain

- ✓ Eye redness or irritation is usually the result of staring at the bright backlight of screens for a long period of time.
- ✓ Dry eyes can result from reduced blinking rates. Screens set at eye level can also cause dryness.
- ✓ Blurred vision is often due to screen glare. The chance of glare rises with bright overhead lights, older computer monitors, dirty screens, and outside sun.
- ✓ General fatigue can occur from staring at screens and straining to see small fonts and images.
- ✓ Back pain can occur because of poor body posture when a screen is not positioned properly.
- ✓ Neck pain is usually caused by poor screen and monitor positioning. Painful pressure can build on muscles if the neck is constantly moving up or down.
- ✓ Headaches can be caused by repeated eye strain.

Digital Eye Strain – Who’s at Risk?

More than 70 percent of Americans don’t know or don’t believe that they are susceptible to digital eye strain. But the truth is that anyone in front of a digital screen is at risk, regardless of age, occupation or lifestyle. While certain factors can increase the possibility of digital eye strain symptoms, people who spend more than two hours a day on computers or other digital media devices should reassess their use.

In its survey of nearly 10,000 adults, ages 18 and older, The Vision Council identified these trends by gender, age and lifestyle. The data is reflected in the profile sketches detailed on pages 6 and 7.

Gender:

Women are more likely than men to experience problems associated with digital eye strain. About a third report eye strain and neck and shoulder pain, and at least one in five women has suffered dry eyes (24 percent), blurred vision (22 percent) and headaches (23 percent).

Men and women report similar use of digital media devices. Women are slightly higher consumers of smartphones, tablets and laptops, while men report higher regular use of desktop computers and video game systems. Gender doesn’t appear to affect usage; men and women both average about four to six hours daily, and 10 percent of men and women report 12 or more hours daily of digital media use. Both men and women say recreation (e.g., video games, computer games and sport channels) is their primary reason for using digital media devices.

Age:

Digital eye strain symptoms are common in adults under 55. But adults ages 45 and older are 14 percent to 23 percent less likely to experience headaches compared to their younger counterparts.

Not surprisingly, digital media preferences change across generations. While television remains the most popular digital device for all ages, adults under 35 are more likely than other ages to use devices like laptops (76 percent), smartphones (66 percent), video games (49 percent) and tablets (30 percent). Conversely, individuals 55 and older are less likely than other ages to use laptops (52 percent), smartphones (22 percent), video games (10 percent) and tablets (20 percent).

Across all ages, the majority of adults use digital media four to six hours a day. For about 14 percent of young adults (ages 18-34), average usage is more than 12 hours daily.

Recreation is the main reason for digital media use across age groups. However, mid-career adults (ages 35-55) report higher use for work and business-related reasons.

Lifestyle:

Individuals who primarily use digital media for work are more likely to experience symptoms of digital eye strain – whether a higher incidence of eye strain (39 percent), neck and shoulder pain (42 percent), dry eyes (25 percent) or blurred vision (23 percent).

These same working adults also spend more time than other groups on digital devices: More than 30 percent spend at least six hours a day, and 20 percent spend 10 to 12 hours a day.

Examples of Digital Eye Strain



THE GAMER

The Gamer:

- Ages: 18-34
- Gender: 33 percent of men and 26 percent of women surveyed regularly use video game systems
- Popular devices: Video game systems
- Digital media consumption: 6+ hours/day
- Digital eye strain symptoms: Neck and shoulder pain (38 percent), eye strain (37 percent), headache (25 percent)

Risk: Many gamers admit to their prolonged digital media use, and more than a third are concerned that they may develop digital eye strain. About 14 percent of gamers report using digital media 12 or more hours a day. The challenge with gamers is that these activities are social and fun, which can easily turn a few minutes of play into several hours of screen time.

Solutions:

- ✓ Ergonomically-friendly computer/gaming stations
- ✓ Ambient lighting
- ✓ Computer eyewear

The Stay-at-Home Mom:

- Ages: 25–39
- Popular devices: Smartphones and computer tablets
- Digital media consumption: 10.9 hours/day^v
- Social time: 45 percent more likely than other groups to regularly use social media^{vi}

Risk: Convenience is important, and the Internet is a one-stop shop for news, entertainment and communication. It's easy for a mom to spend the few breaks she has in front of a computer screen. That type of intensity can lead to eye strain and fatigue. Especially for mom bloggers,^{vii} who represent one out of every three bloggers, certain precautions need to be taken to keep eyes healthy.

Solutions:

- ✓ Frequent eye breaks
- ✓ Resetting browser and computer settings
- ✓ Computer eyewear



THE STAY-AT-HOME MOM



THE ACADEMIC

The Academic:

- Ages: 18-34 (undergraduate and graduate students)
- Gender: 3 percent of men and women surveyed primarily use digital devices for school
- Popular devices: Laptops, smartphones and TVs
- Digital media consumption: 4-6 hours/day
- Digital eye strain symptoms: Neck and shoulder pain (40 percent), eye strain (37 percent), headache (29 percent)

Risk: It's easy to see why college students spend four to six hours daily on digital media, whether they're taking notes on their laptop during class or researching a topic via the Internet. Plus they're using social media to stay in touch with friends and family back home. That's a lot of time in front of a digital screen.

Solutions:

- ✓ Frequent eye/study breaks
- ✓ Ergonomically friendly study station
- ✓ Computer eyewear

The Career Climber:

- Ages: 35-54
- Gender: 23 percent of men and 25 percent of women surveyed primarily use digital devices for work or business
- Popular devices: Computers, smartphones and computer tablets
- Digital media consumption: 6+ hours/per
- Digital eye strain symptoms: Neck and shoulder pain (42 percent), eye strain (39 percent), dry eyes (25 percent)

Risk: Professionals who need to be constantly connected to work are rarely able to rest their eyes from computers, tablets, smartphones and other devices. The constant visual consumption not only can irritate eyes but can cause body aches and strains. Career climbers are advised to incorporate quick breaks and modify screen settings in order to reenergize eyes and reduce eye tension.

Solutions:

- ✓ Enlarged smartphone font
- ✓ Ergonomically friendly work station
- ✓ Computer eyewear



THE CAREER CLIMBER



2012 VisionWatch Findings

To better understand the consequences of digital eye strain, The Vision Council surveyed nearly 10,000 adults across the country about their use of digital media and symptoms of vision stress.

The most surprising finding: More than two-thirds of adults who report regular use of digital media devices experience symptoms of digital eye strain. Many do nothing to lessen their discomfort, because of either inertia or a lack of knowledge.

The survey also revealed a general lack of knowledge about digital eye strain as a real health issue. Fewer than one in five adults have heard the term; only 23 percent are aware that special digital-use eyewear exists that can help reduce symptoms.

Among the survey's other findings:

Respondents regularly use digital media devices:

- Television (83%)
- Desktop computer (67%)
- Laptop computer (65%)
- Smartphone (45%)
- Video game system (30%)
- Tablet or e-reader (26%)

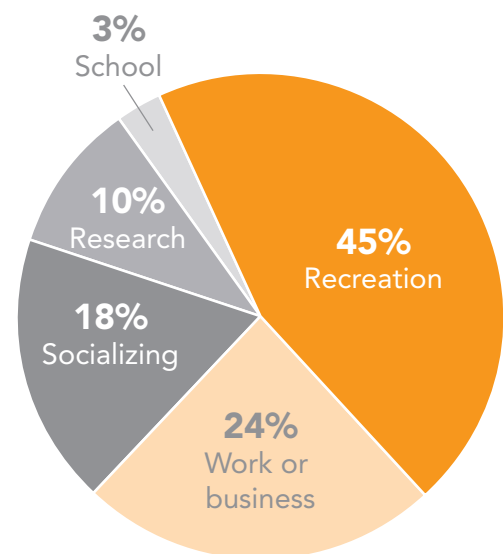
On a typical day, respondents use digital media devices:

- 3 hours or less (20%)
- 4-6 hours (33%)
- 7-9 hours (22%)
- 10-12 hours (14%)
- More than 12 hours (10%)

Respondents' main reason for using digital technology is:

- Recreation (45%)
- Work or business (24%)
- Socializing (18%)
- Research (10%)
- School (3%)

Respondents' main reason for using digital technology is:



Respondents experience vision problems and related issues after using digital media devices for a prolonged period:

- Neck and shoulder pain (34%)
- Eye strain (32%)
- Dry eyes (20%)
- Blurred vision (20%)
- Headache (18%)
- Other (2%)

To relieve symptoms, respondents have tried:

- Changing their sitting position (58%)
- Looking away from their screens (51%)
- Changing their lighting (32%)
- Modifying their work station (31%)
- Wearing special digital-use eyewear (8%)
- Other (4%)
- None of the above (17%)

Parents who use digital media more than six hours daily often have children with similar digital device habits.



Starting Early: Children and Digital Media

Today's children often seem more comfortable communicating by text message than in person. And given the profusion of technology targeted for them, this should be no surprise. Kids' exposure to digital media begins early and continues throughout childhood. As they grow, so do their digital devices.

Kid-friendly gadgets and apps are an ever-expanding market. Children's books are now offered on tablets, laptops are designed for kids as young as 5, and video game consoles continue to top annual holiday gift lists.

Parents are frequently conflicted about their children's exposure. In a 2012 Euro RSCG Worldwide survey of U.S. fathers, 76 percent said that children who grow up without access to the Internet are at a serious disadvantage. But the same percentage of dads were also concerned that digital media could hamper children's reading and writing development.^{viii}

The consequences for children's vision is a lesser worry. The Vision Council's survey found that 37 percent of parents are not concerned that their children's digital media use could strain their eyes. Nearly half (47 percent) were somewhat concerned, but only 16 percent were very concerned.

This is especially troubling as more research shows a growing trend in digital use among children. In a 2011 study, Nielsenwire found a 9 percent increase in tablet use among children under 12.^{ix} A different report by Sesame Workshop found that children between the ages of 8 and 18 are exposed to 2.5 more hours of digital media today than they were in the 1990s.^x



The Doctor's Note:

As a New Yorker, I'm reminded every day of the digital world in which we live. I'm constantly bumping into people who seem incapable of looking away from their gadgets as they walk down the street. But it's as an optometrist that I'm beginning to really see the effects of this behavior.

More and more, patients come to me complaining of dry and irritated eyes. When we begin to talk about lifestyles and habits, it often becomes clear that the likely cause is prolonged screen time.

Americans are spending excessive periods of time on digital media devices. I routinely see patients who tell me that they are logging six to 10 hours of use a day. That is a lot of time for our eyes to focus on digital content. As eye muscles tire, they have to work extra hard to focus, which means more strain and stress on the eye. And all of this exertion can extend to the head, neck and shoulders.

Although digital eye strain problems aren't permanent, eye strain, red or dry eyes, blurred vision and headaches will persist without action. The solutions really are simple.

I always tell my patients to stop and look at how they are using those hand-held gadgets. Once they have a good mental picture, I tell them to readjust particular settings to make the screen easier on their eyes. I also strongly recommend looking into computer eyewear to help protect eyes from continuing problems. Most computer eyewear is affordable and available in prescription and nonprescription lenses.

*Justin Bazan, OD
Brooklyn, New York
Member, Better Vision Institute*

Preventing Digital Eye Strain

Digital eye strain is easily preventable. The obvious answer is to limit digital media use, but for the vast majority of Americans who can't – or won't – there are multiple ways to lessen the impact of screen time.

An important point is to pay attention to your body. Sudden eye, neck, head or shoulder pains are a warning sign of strain. If your eyes feel irritated, take a couple moments to look away from the screen, relax and make minor adjustments.

Adjust external factors:

- **Reduce glare.** Adjust the brightness of your screen by checking the control settings on your digital device. Consider changing your background color from bright white to a cooler gray. Glare reduction filters are also available and can easily attach to computer screens.
- **Clean your screen.** Frequently dust and wipe digital screens to help reduce glare.
- **Dim your surrounding lighting.** Lessen the amount of overhead and surrounding light that is competing with your device's screen. Dim inside lights and try to avoid outside areas of intense brightness. This can help to reduce glare and strain.
- **Keep your distance.** Position your device so there is sufficient distance between your eyes and the screen.
 - For computers, try sitting in your chair and extending your arm. Your palm should be able to rest comfortably on the monitor (as if you're high-fiving the screen).
 - For hand-held devices, try to keep the device a safe distance from your eyes and hold it just below eye level.
- **Adjust your screen.** Digital screens should always be directly in front of your face and slightly below eye level. Do not tilt a computer monitor.
- **Increase text size.** Bump up text size to help better define the content on your screen. Use the settings control to make adjustments that feel comfortable to your eyes.

Remember internal factors:

- **Blink more often.** Staring at a digital screen can affect the amount of times you blink, causing eyes to dry. Remind yourself to blink more often, which will also help to refocus your eyes.
- **Take a 20-20-20 break.** Even short breaks can make a huge difference. Every 20 minutes, take a 20-second break and look at something 20 feet away.

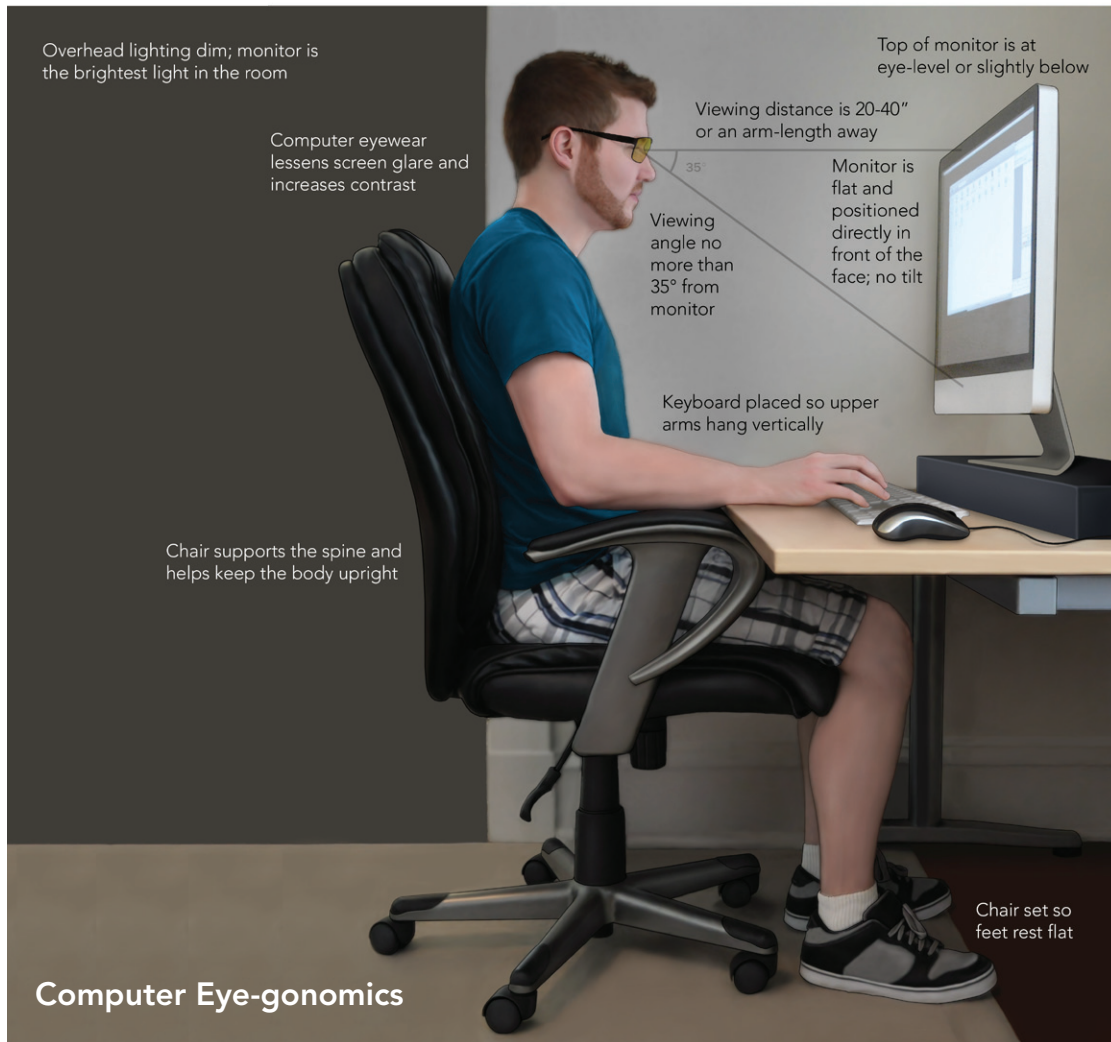


Consider Special Eyewear:

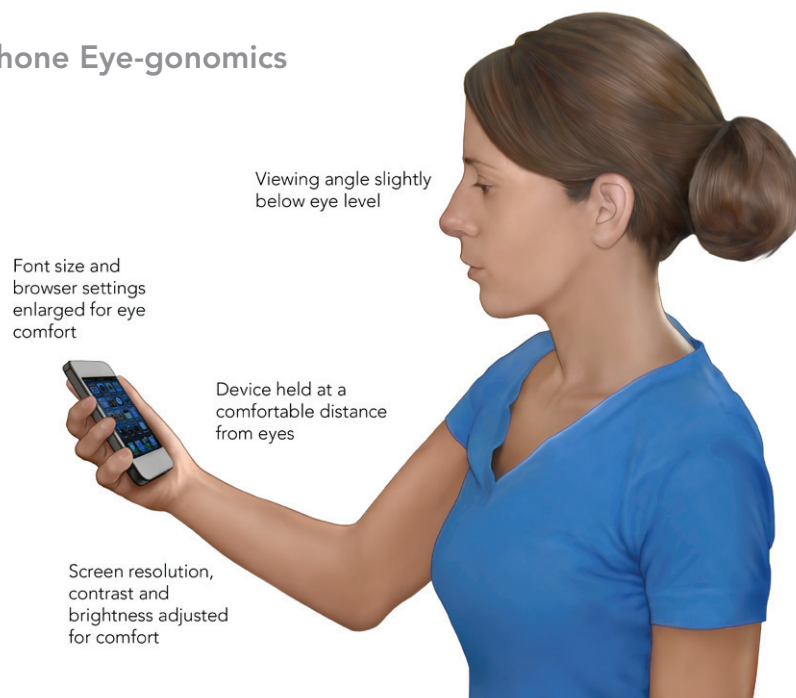
- **Consult your eye care provider.** Talk with a provider about the best eyewear options for you. Eye care experts can perform a comprehensive eye exam to determine crucial eyewear considerations like a new or updated prescription. Prepare for a visit by measuring your current eye-to-screen distance.
- **Use prescription eyeglasses.** Eye strain may result from deteriorating vision. Age-related vision loss is common in older adults and prescription eyeglasses can help correct vision problems. For adults with eyeglasses, check with an eye care provider to determine if your prescription is out of date. An incorrect prescription can exacerbate symptoms of digital eye strain.
- **Consider a second pair of eyeglasses.** Glasses used for activities like reading and driving are not effective for computer use. Depending on your prescription, lenses are designed to bring objects at close or far distances into focus; computers are often not in this range. Purchase a separate pair of prescription eyeglasses created strictly for office or computer use. Look for lenses that are digitally ground to help minimize aberration or distortion and help you see clearly.
- **Wear computer eyewear.** Computer eyewear is designed to reduce glare from various digital devices like computers and tablets. Using specialized lenses, tints and coatings, computer eyewear improves contrast, reduces screen glare and relaxes eye muscles. It is available in both prescription and non-prescription.
 - Single vision lenses help the eye adjust to intermediate-distance objects – like computer screens. Their modified lens power relaxes the eye while providing a large field of view. Occupational progressive lenses correct objects at near, intermediate, and far distances. The intermediate zone for these lenses is larger than regular progressives, making them appropriate for computer use.
 - Anti-reflective coatings help combat eye strain by softening the glare of harsh office and outdoor lighting. Tints can also block glare from blue light, which is a short wavelength emitted by digital screens.



Eye-gonomics 101



Smartphone Eye-gonomics



Workplace Wellness

Computer-related vision problems can have a huge impact on job performance. As a human resource professional, I'm keenly aware of just how taxing computer screens can be on employees' eyes. Especially during intense or busy periods, I used to hear frequent complaints about irritated eyes and blurred vision. But my colleagues see things differently now.

In recent years, I've made it a priority to recommend the most ergonomic workstations possible. Since there's no getting around computers in our business, I now do my best to help employees create a digital-friendly work zone.

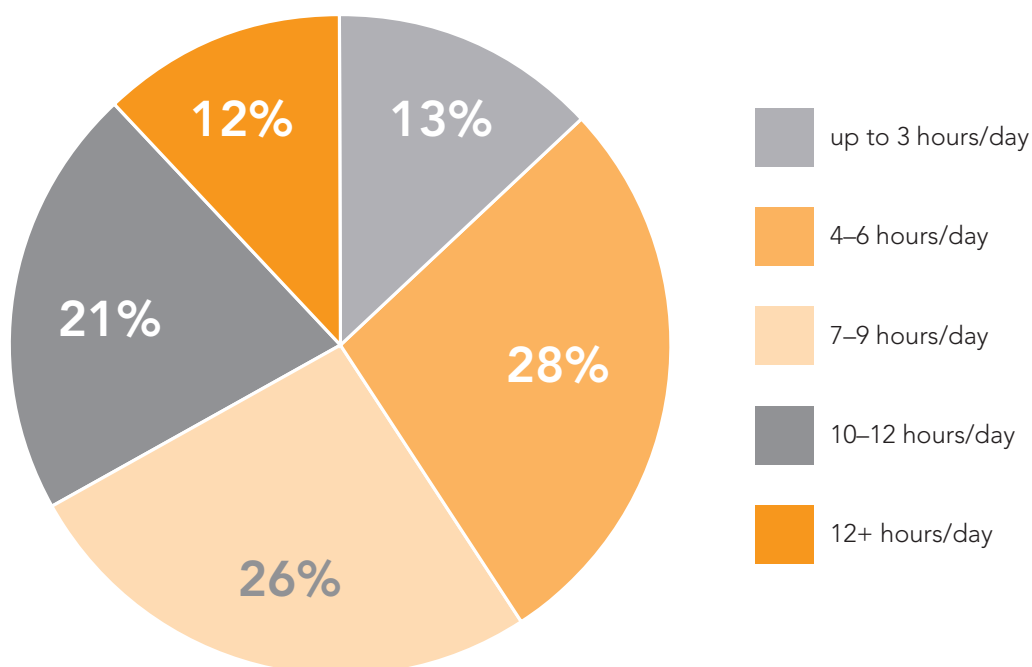
I teach employees how to adjust both their chair height and computer settings to be comfortable for eyes, neck and shoulders. Computers with liquid crystal display (LCD) screens can help to cut glare and relieve eyes from potential strain. And small details like overhead and outdoor lighting can also impact workplace productivity. Simple changes, yes, but they really do foster a healthier, less stressful work environment.

It's always interesting to see how people react to an "ergonomic workstation makeover." Overall, I've heard terrific feedback. Many employees tell me that their posture and vision issues have all but disappeared.

Kelley Ridge, SPHR
Senior Human Resources Professional
Washington, DC

Computer vision syndrome is estimated to be 40 times more common than carpal tunnel syndrome.^{xi}

Hours Spent on Digital Media Devices for Work-Related Reasons



In Conclusion

No one knows how digital technology will evolve in coming years. But it seems certain that tablets will get even smaller, phones will have even more apps, new devices will be invented, and our eyes will spend a lot more time staring at screens for work, school and fun. We need to learn how to interact safely with this technology. Above all, we need to develop healthy eye habits.

The Vision Council is working with eye care providers and member companies to educate consumers about the problems associated with digital eye strain. While symptoms aren't permanent, they can be distracting and painful, and they only go away when something is proactively done to give eyes a break.

Experiences of digital eye strain may also be due to a more serious eye disease. Comprehensive eye exams can address and resolve digital eye strain while also identifying whether a sight-threatening disease is present. With this reassurance and advice, individuals can be more confident of a comfortable and productive digital and visual future.

The Vision Council reminds users to be mindful when using digital devices. Take breaks, move away from the screen, and limit the amount of competing light. Increase your comfort with eyewear specifically designed for computer use. Special lenses help to lessen eye strain, allowing eyes – and you – to focus on the task at hand.

For more information about digital eye strain, visit www.thevisioncouncil.org.



About The Vision Council: *Serving as the global voice for vision care products and services, The Vision Council represents the manufacturers and suppliers of the optical industry through education, advocacy and consumer outreach. By sharing the latest in eyewear trends, advances in technology and advice from eyewear experts, The Vision Council serves as a resource to the public looking to learn more about options in eyeglasses and sunglasses.*

Endnotes

ⁱKids and Consumer Electronics, 2011 Edition. The NPD Group. July 2011. http://www.npd.com/press/releases/press_110720.html

ⁱⁱMacular Degeneration Support. Computer Vision Syndrome and Computer Glasses. October 2003. <http://www.mdsupport.org/library/cvs.html>

ⁱⁱⁱOptometry & Vision Science. Font Size and Viewing Distance of Handheld Smart Phones. July 2011.

^{iv}Computer Vision Syndrome. University of Pennsylvania Scheie Eye Institute. <http://www.penmedicine.org/ophth/conditions/cvs.html>

^vNielson and BabyCenter, LLC. American Media Mom Report. April 2012. <http://www.jnj.com/connect/news/all/babycenter-unveils-the-2012-american-media-mom-always-on-in-control-and-changing-the-rules-for-marketers>

^{vi}Nielson and BabyCenter, LLC. American Media Mom Report. April 2012. <http://www.jnj.com/connect/news/all/babycenter-unveils-the-2012-american-media-mom-always-on-in-control-and-changing-the-rules-for-marketers>

^{vii}Nielson Wire. Infographic: The Digital Lives of American Moms. May 11, 2012. http://blog.nielson.com/nielsenwire/online_mobile/digital-lives-of-american-moms/

^{viii}Euro RSCG Worldwide. Does Being Tech Savvy Make You a Better Dad? June 2012. <http://www.prosumer-report.com/blog/2012/06/18/does-being-tech-savvy-make-you-a-better-dad/>

^{ix}Nielsenwire. American Families See Tablets as Playmate, Teacher, Babysitter. February 2012. http://blog.nielson.com/nielsenwire/online_mobile/american-families-see-tablets-as-playmate-teacher-and-babysitter/

^xThe Joan Ganz Conney Center at Sesame Workshop. Always Connected: The New Digital Media Habits of Young Children. March 2011. <http://www.joanganzcooneycenter.org/Reports-28.html>

^{xi}Natural Approach to Computer Vision Syndrome and Eyestrain. About.com January 2008. <http://altmedicine.about.com/cs/backpain/a/Computer.htm>