

# MITIGATING EYE DISCOMFORT AND FATIGUE IN THE DIGITAL ERA

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4<sup>th</sup> CROSH  
Conference

## computer fatigue

- modern technology is affecting our sleep
- artificial light
  - affects melatonin production and throws off circadian rhythms
  - prevents deep, restorative sleep
- intensive use of cell phones and computers
  - increase in stress, sleep disorders and depressive symptoms
- in a study, 4,100 young adults were surveyed
  - heavy cell phone use showed an increase in sleep disorders in men and an increase in depressive symptoms in both men and women
  - those constantly accessible via cell phones were the most likely to report mental health issues
  - men who use computers intensively were more likely to develop sleeping problems
  - regular, late night computer use was associated with sleep disorders, stress and depressive symptoms in both men and women
  - frequently using a computer without breaks further increases the risk of stress, sleeping problems and depressive symptoms in women
  - a combination of both heavy computer use and heavy mobile use makes the associations even stronger



## physical eye discomfort

- felt by many individuals after two or more hours in front of a digital screen

Nearly 90% of North Americans use digital devices for two or more hours each day

Nearly 60% of North Americans use digital devices for five or more hours each day and 70% of North Americans use two or more devices at a time

More than nine out of 10 people with digital eye strain use devices for two or more hours each day.



77% of the individuals who suffer from digital eye strain use two or more devices simultaneously.



70% of women report experiencing symptoms of digital eye strain and are more likely than men to simultaneously use multiple devices.



## use of technology

- can have unintended consequences for our health



76% of Americans look at their digital devices in the hour before going to sleep.



Adults under 30 experience the highest rates of digital eye strain symptoms (73%) compared with other age groups.



41% of women report experiencing back pain or text neck symptoms compared to 30% of men.



## digital eye strain

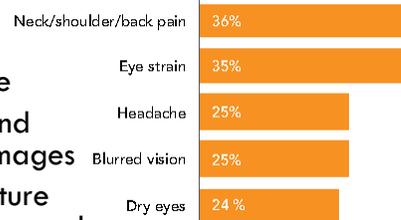
- reported by 65% of adults
- physical discomfort felt after two or more hours in front of a digital screen
- symptoms are different for each person
- not a permanent condition, but can have a strong and lasting effect on individuals
- **most common computer-related repetitive strain injury among workers**

43% of adults work in a job that requires prolonged use of a computer or tablet

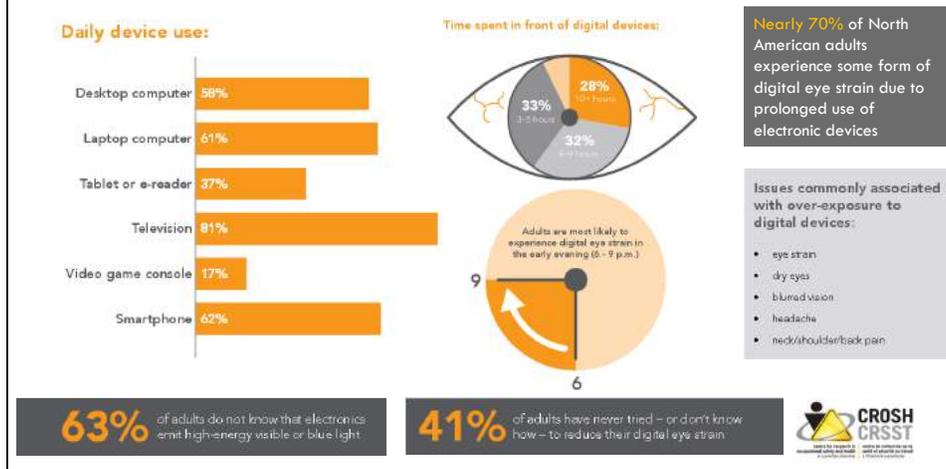


## symptoms of digital eye strain

- eye redness or irritation from staring at the bright backlight of screens for long periods
- dry eyes due to reduced blinking
- blurred vision due to screen glare
- fatigue from staring at screens and straining to see small fonts and images
- back pain due to poor body posture when a screen is not positioned properly
- neck pain caused by poor screen and monitor positioning
- headaches from repeated eye strain



## digital eye strain (some figures)



## contributing factors

- several factors can signal the onset of digital eye strain
- following section includes a brief overview of the most common factors, with tips on ways to resolve them
- more than 40 percent of adults have never tried — or do not know how — to reduce digital eye discomfort



## existing vision problems



- individuals with existing vision problems have a greater likelihood of developing digital eye strain
  - eyes are forced to deal with abnormal vision issues while at the same time focusing on the complexity of digital content
- the corrective glasses and contact lenses can contribute to digital eye strain
  - lenses designed to bring near or far objects into focus are not built for the mid-distance range of a computer
- for relief during computer use obtain lenses designed specifically for the eye-to-computer viewing range
  - lenses should also have an antireflective coating to reduce glare



## digital devices



- different digital devices cause different degrees of vision discomfort
  - crispness of high-definition displays can feel easier on the eyes than an older screens
- desktop computers are the device most likely to cause digital eye strain
  - small screen displays are compounding the problem



## viewing distance



- ❑ strain is often caused by the distance between the eyes and a digital screen
- ❑ our eyes are not designed to focus on words and images at a mid-point distance
- ❑ for optimal viewing, set your computer about an arm's length away from your face. When sitting straight, you should be able to extend your arm and high-five the computer screen
- ❑ mobile phones and hand-held devices should be kept at a comfortable distance from your eyes and at an angle just slightly below eye level



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### Smartphone Eye-gonomics



## digital content



- digital content is created by thousands of tiny dots of light called pixels
- unlike ink on paper, pixels lack uniform density and defined borders, making them harder to bring into focus
- even on high-definition displays, text characters and images formed with pixels can be less distinct than those on a printed page
- this is especially true when holding a handheld device closer to the eyes than recommended



## time spent in front of digital screens

- spending just two consecutive hours on a digital device can cause eye strain and fatigue
- the eye exerts a lot of energy to focus on the mid-distance range of a screen
  - ▣ muscles become tired and stressed
- strain can extend to the head, neck and shoulders
- repetitive staring can disrupt the natural blinking process



## age



- age can also impact the likelihood and frequency of digital eye strain
- vision problems as a normal part of the aging process can contribute to computer related strain
- digital eye strain is most common among adults aged 18 to 34
  - ▣ still highly prevalent among those aged 35 to 54
- digital eye strain typically decreases after age 55
  - ▣ likely because of reduced computer use
- children also are at risk for eye strain
  - ▣ children don't realize that blurred vision or discomfort is unnatural

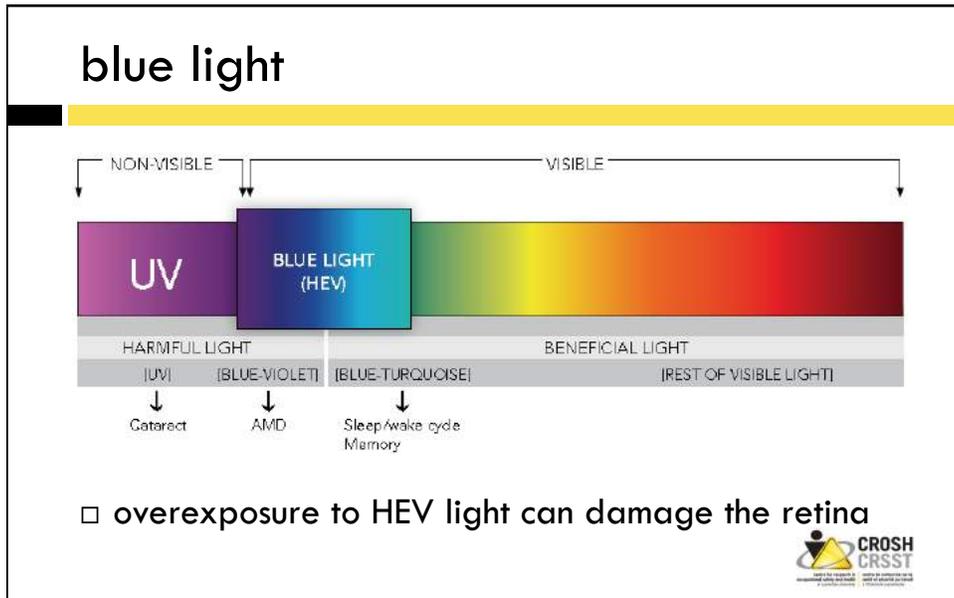
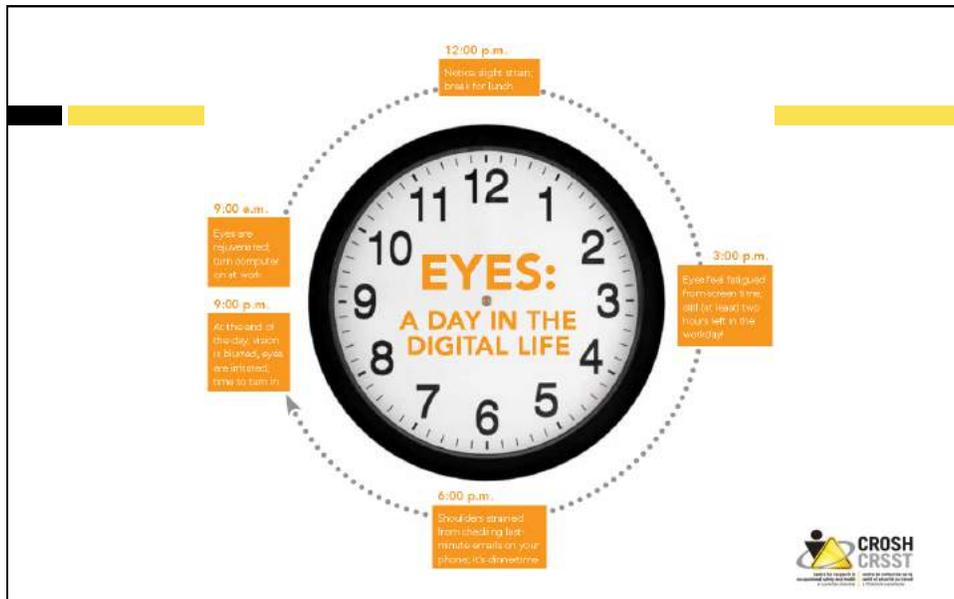


## time of day



- the majority of adults experience digital eye strain between 3 and 9 p.m.
  - ▣ eyes are already fatigued from hours of screen viewing
  - ▣ must work extra hard to focus on new stimuli
- to relieve eyes in the afternoon, take multiple breaks from the computer screen
- if sitting near a window or under harsh lights, dim surrounding lights so that the screen is the brightest surface in the room





## advances in lens technology

- computer glasses help the eye adjust to intermediate-distance objects such as computer screens
- relaxes the eye
- anti-reflective coating helps combat eye strain
  - softens glare of harsh indoor and outdoor lighting
  - improves the contrast of digital content
- special lenses can absorb harmful blue light, keeping it from entering through the cornea
  - lenses are either infused with melanin or use a blue-light filtering coating



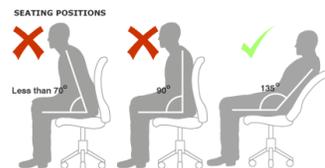
### AMBER LENS

- PREFOCUSES LIGHT TO RELIEVE MUSCULAR EYE STRAIN
- HIGHLY WRAPPED TO RETAIN EYE MOISTURE
- ANTI-REFLECTIVE ANTI-GLARE COATINGS
- DURABLE HARD COATING PRESERVES OPTICAL INTEGRITY
- MADE FROM OPTICALLY CLEAR mAMIX™ LENS MATERIAL
- LIGHT TRANSMISSION TUNED TO ELIMINATE STRESSFUL
- HIGH ENERGY VISIBLE (HEV) BLUE LIGHT



## proper workstation setup

- tip #1: correct sitting posture



- tip #2: use a standing desk
  - improves overall posture
  - increases your stamina



## minimize eye strain



- tip #3: correct ambient lighting
  - no harsh lighting
  - use shades and curtains
  - avoid fluorescent bulbs
- tip #4: optimize screen settings
  - screen brightness should match ambient lighting
- tip #5: blink regularly
  - **the 20-20-20-20 system:** blinking 20 times in a row every 20 minutes should be combined with looking away from the screen for 20 seconds and focusing on an object 20 feet away



## take frequent breaks



- tip #6: get your blood flowing
  - Take a walk or shake your limbs
- tip #7: refresh your mental clarity
  - break your attention away from the computer
- tip #8: use the Pomodoro technique
  - interweave short breaks with longer periods of work
- tip #9: learn to relax
  - sit back, relax, and clear your mind





THANK YOU

QUESTIONS?

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