Glenn Vessey OPTOMETRISTS

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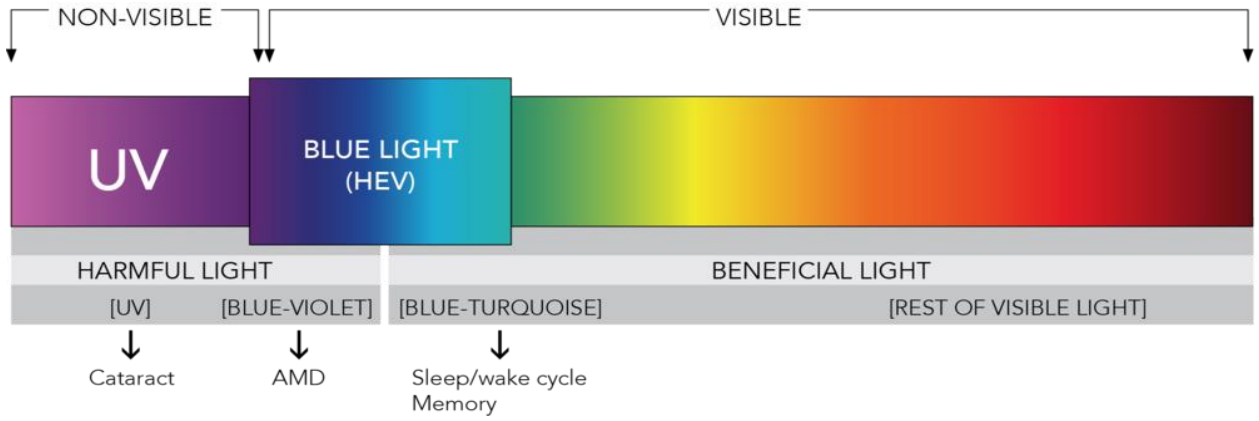
# BLUE LIGHT

Light is made up of electromagnetic particles that travel in waves. These waves range in length, strength and the energy they emit. The shorter the wavelength; the higher the energy. Every wavelength is represented by a different colour, and is grouped into the following categories: gamma rays, x-rays, ultraviolet (UV) rays, visible light, infrared light (heat), and radio waves. Together these wavelengths make up the electromagnetic spectrum.

The human eye is only sensitive to one part of this spectrum: visible light. Visible light is that part of the electromagnetic spectrum that is seen as colours: violet, indigo, blue, green, yellow, orange and red. Blue light has a very short wavelength, and so produces a higher amount of energy. Studies suggest that, over time, exposure to the High Energy Visible (HEV) light could cause serious long-term damage to your eyes.




**Blue light is everywhere.**
Sunlight is the main source of blue light, and being outdoors during daylight is where most of us get most of our exposure to it. But there are also many man-made, indoor sources of blue light, including fluorescent and LED lighting and flat-screen televisions.
Most notably, the display screens of computers, electronic notebooks, smartphones and other digital devices emit significant amounts of blue light. The amount of HEV light these devices emit is only a fraction of that emitted by the sun. But the amount of time people spend using these devices and the proximity of these screens to the user's face causes concern about possible long-term effects of blue light on eye health.

**Why should we be concerned about blue light exposure?**
Due to the higher energy levels blue light waves flicker more easily than longer, weaker wavelengths. This kind of flickering creates a glare that can reduce visual contrast and affect sharpness and clarity. This flickering and glaring may be one of the reasons for eyestrain, headaches, physical and mental fatigue caused by many hours using a computer screen or other electronic device.
Our eyes' natural filters do not provide sufficient protection against blue light rays from the sun, let alone the blue light emanating from cell phones, computers, tablets and flat-screen televisions as well as fluorescent and LED lighting. Prolonged exposure to blue light may cause retinal damage and contribute to age-related macular degeneration, which can lead to permanent loss of vision.

**What are the effects of blue light exposure on our health?**
Blue light can help elevate your mood and boost awareness, but chronic exposure to blue light at night can lower the production of melatonin, the hormone that regulates sleep, and disrupt your circadian rhythm and sleep patterns. Harvard

researchers have linked working the night shift and exposure to blue light at night to several types of cancer (breast, prostate) diabetes, heart disease, obesity and an increased risk for depression.

Researchers aren't exactly sure why exposure to blue light at night seems to have such detrimental effects on our health, but it is known that exposure to light suppress the secretion of melatonin. Lower melatonin levels might explain the association with these types of health problems.

Most of us spend the majority of our waking hours staring at digital screen, whether it's the computer, mobile phone, video game or TV. Digital eyestrain is a new term used to describe the conditions resulting from the use of electronic devices.

**Digital electronic devices emit blue light that can cause eye strain and may lead to serious eye diseases later in life**

Digital eyestrain is a medical issue with serious symptoms that can affect learning and work productivity. Symptoms of digital eyestrain include blurry vision, difficulty focusing, dry and irritated eyes, headaches, neck and back pain. It affects children as well as adults with children have access to many digital devices. According to a study by the Kaiser family Foundation, children and teenagers (ages 8-18) spend more than 7 hours a day consuming electronic media. Before age 10, children's eyes are not fully developed. The eye's crystalline lens and cornea are still largely transparent and overexposed to light, so too much exposure to blue light harmful to the eye. Parents should supervise and limit the amount of screen time their children are permitted.

Nearly 70% of adults who report regular usage of media devices experienced some symptoms of digital eyestrain, but many did nothing to lessen their discomfort mainly due to lack of knowledge. There's growing medical evidence that blue light exposure may cause permanent eye damage, by destroying retinal cells in the macula leading to age-related macular degeneration, and permanent vision loss.

### Who needs protection from blue light exposure?

We all do. Everyone needs to take precautions against the effects of blue light. Whether we work in an office or play in the sun; spend hours staring at a computer screen or texting on our cell phones, we are all being exposed to blue light.

### Protection from Blue Light- Filters and Protective Eyewear

Computer spectacles can also be helpful to reduce blue light exposure from computers and other digital devices. These special-purpose glasses are available without a spectacle prescription if you have no need for vision correction or if you routinely wear contact lenses to correct your eyesight. Or they can be prescribed to optimize your vision specifically for the distance from which you view your devices.

If you have presbyopia and routinely wear bifocals or progressive lenses, prescription computer glasses give you the additional benefit of a much larger field of view for seeing your entire computer screen clearly. (Keep in mind, though, that this type of computer eyewear is exclusively for seeing objects within arm's length and cannot be worn for driving or other distance vision needs.)

There are special glare-reducing anti-reflective coatings that also block blue light from both natural sunlight and digital devices. There are apps (F.lux) and functions on Smart phones that can be applied to devices to reduce the amount of blue light the screen emits.

Ask our Optometrists about which type of vision correction and lens features best suit your needs for viewing your computer and other digital devices and protecting your eyes from blue light.