Prolonged exposure to blue light: a worrying risk for visual health

Back-to-school season will mean many Canadians are past vacation mode and headed back the full time grind at work. With this change in seasons also comes a caveat: more time spent looking at computer and digital tablet screens[1] translates to increased exposure to blue light,-- the main consequence of these new visual behaviours.

Beyond chronic eye fatigue and sleep disruption, prolonged exposure to harmful blue light may affect long-term eye health and contribute to the development of age-related macular degeneration (AMD). This degenerative eye disease alters central vision and may lead to an increasing difficulty to read, drive and recognize familiar faces and, in the most severe cases, total blindness, of which it is the leading cause today. One million Canadians are currently suffering from AMD and this number is expected to double in the next 30 years, especially among members of Generation Z and Millennials, all born in a screen-rich world, who will have been exposed to much greater amounts of blue light throughout their lives than their elders.

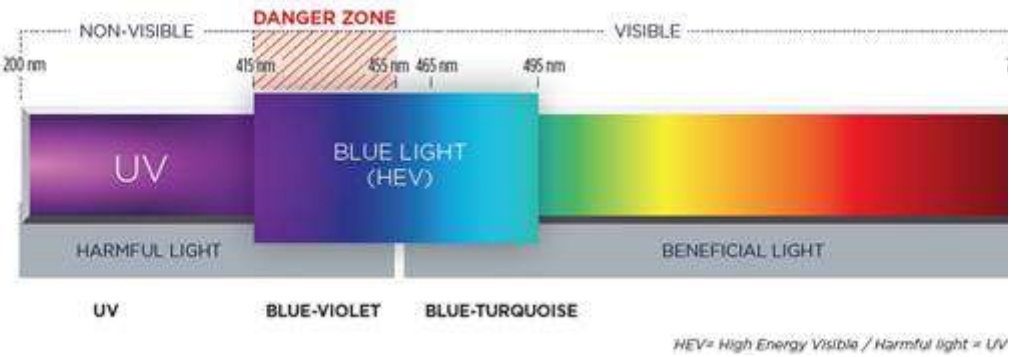
What is blue light?

Blue light sources may be natural, such as the sun, or artificial, like fluorescent bulbs and LED lighting found in most offices and homes, and integrated in the screens of most modern electronic devices (smartphones, computers, tablets, televisions). While the sun remains the biggest source of blue light, the amount of artificial sources is growing, thereby lengthening Canadians' total exposure time.

Blue light is part of the visible colour spectrum, which is essential to our vision, as it enables us to distinguish shapes, details and colours. Each colour of the visible spectrum emits a specific amount of energy: toward the red side of the spectrum, wavelengths become weaker, while toward the violet side, wavelengths put out more energy. This is why UV rays are the most harmful (see graph below).

One of the characteristics of blue light is that it is both helpful and harmful, as it's on the cusp between visible and invisible light. Blue-turquoise light is a key part of our visual acuity and well-being, while blue-violet light is harmful, since it penetrates our eye and damages the retina.

[1] 30% of adults spend over 9 hours a day using digital devices. Vision Council 2015 Digital Eye Strain report



Source: Essilor Canada

Short term

Harmful blue-violet light causes shimmering and glare, and reduces contrast. This puts additional strain on the eyes to compensate and leads to ocular fatigue, headaches, as well as physical and mental fatigue.

However, the blue-turquoise part of the blue-light spectrum is actually beneficial to humans. Exposure to blue-turquoise light during daytime hours stimulates the production of melatonin, the hormone that regulates our sleep-wake cycle, affects our mood, and stimulates alertness, memory and cognitive functions. However, exposure to harmful blue-violet light, especially in the evening, disrupts sleep cycles which, in turn, leads to fatigue, trouble concentrating, memory impairment, as well as increased risks of depression, obesity, etc.

Long term

While the cumulative effects of exposure to harmful blue-violet light are particularly alarming on the long term, 40% of Canadians remain unaware of this risk[2] and its sources[3].

Despite the eyes' natural defences, an increasing amount of medical evidence has revealed that daily exposure to harmful blue-violet light and its cumulative effects can damage the retina, a part of the inner eye that enables us to perceive objects and transmits images to our brain. This can lead to eye diseases such as AMD, for which there is currently no treatment. As a result, it is imperative that we protect ourselves from harmful blue-violet light as early as possible and throughout our lives.

Children are particularly sensitive to blue light. As their eyes are still developing until age 10, six times more light passes through their crystalline lenses than those of an adult. Their vision must therefore be protected as early as possible by limiting their screen time.

Protecting against blue light

Several solutions developed by Essilor Canada are currently available to protect our eyes from blue light, such as surface and integrated lens treatments.

Thanks to the Eye Protect System™, developed by Essilor, eyeglass wearers can now benefit from optimal protection against harmful blue-violet light and UV rays. Combining Crizal® treatments with Varilux®, Eyezen™+ and Transitions® enables to block at least 45% of harmful blue-violet light indoors and up to 88% outdoors, as well as protect against UV rays.

Eyecare professionals are able to advise Canadians on the best solutions for their visual health needs and lifestyle, thereby providing them with the best protection.

Reducing exposure to blue light

[2] Source: bluelightexposed.com.
[3] 63% of adults don't know that electronic devices emit visible, high-energy wavelengths, also known as "blue light". Source: bluelightexposed.com.

Besides the aforementioned solutions, there are many behaviours and attitudes we can easily adopt to reduce our exposure to blue light:

- Reduce our screens' brightness level and keep them at least 60 cm from our eyes (about at arm's length)
- Take breaks every 20 minutes and focus on objects at least 20 feet away for 20 seconds
- Limit screen time, especially for children
- Limit screen time in the evening, especially a few hours before bedtime
- Wear polarized sun lenses like Xperio® when outdoors (these block at least 87% of blue light); and combine these with Crizal® to protect against UV rays.

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About Essilor Canada

Because Canadians have visual needs that impact their lives, and because we care about their vision, Essilor Canada's mission is to Improve Lives by Improving Sight. It translates into everything we do: our products, services, technologies, trainings, philanthropic initiatives, as well as in our involvement in health, environment and safety.
Present in Canada since 1972, Essilor is proud to contribute to the growth of our country's economy with over 1000 employees, 3 digital surfacing laboratories and 40 regional and partner laboratories. Essilor Canada is a subsidiary of Essilor International, the world leader in ophthalmic optical products that invests heavily in research and development to create new products always better adapted to the needs of wearers. Essilor creates, manufactures and personalizes a wide range of corrective lenses and coatings that are distributed through eyecare professionals and help prevent visual health issues, correct and protect vision. Canadians can entrust their vision to Essilor brands such as Varilux®, Eyezen™, Crizal®, Xperio® and Transitions®.