

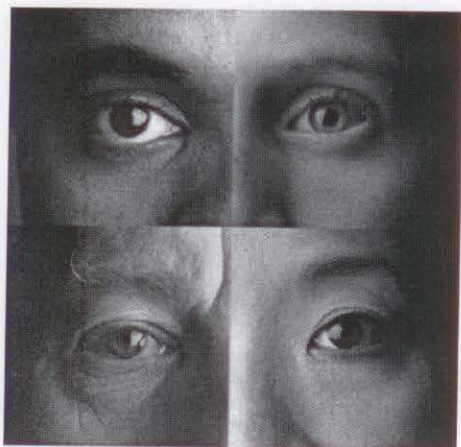
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Light Pollution and Human Health

In the USA today, 56% of children between the ages of 8 and 12 own their own cell phone and many are able to download and use astronomy apps. However, only 1% of those children will be able to see the majority of the objects shown by those apps because of light pollution. This makes for many disappointed, and disillusioned children; uninspired to pursue science. Not only is that frightening from a social and cultural standpoint, it is also terrifying as a health concern. Being exposed to light at night continues to be shown as a factor leading to health problems including obesity, depression, and even cancer, among others.

This is available as a [downloadable and printable brochure](#).



NASA/Goddard Space Flight Center Scientific Visualization Studio
National Eye Institute, National Institutes of Health

Glare on the Eyes

Bright points of light from poorly designed lighting produce a condition known as "disability glare." This can be especially dangerous when driving. Disability glare is so intense that it causes us to avert our eyes from the veil of light being scattered across our retinas. This condition can temporarily cast everything except the light source into virtual invisibility. Older drivers are especially vulnerable to disability glare, because as we age the eye loses its ability to quickly adjust to changing levels of illumination. Fully shielded roadway lighting reduces this hazard and creates a safe and more pleasant driving experience by distributing the light evenly.

Vision and blue light

Daylight is composed of the entire spectrum of color. Different types of visible light, seen as colors, have different wavelengths varying from violet to red light. Blue light is more easily "scattered" in the atmosphere, making it look blue. Our bodies sense this blue light to synchronize our circadian rhythms daily.

Blue light, especially at night, can cause more eyestrain and fatigue than other types of light and may cause halos around objects, because the short wavelength makes it harder for the eye to focus. Just as blue light scatters in the atmosphere, it scatters in our eyes as well, impairing our night vision.

The aging eye is especially vulnerable to eyestrain and loss of night vision. With age, we undergo a natural process that reduces our visual abilities. Issues of contrast, glare, the uniformity of illumination, and the type of light used are all factors that help determine how well we see.

Smart lighting decisions help preserve vision and promote the overall health of the eye.

More information on the effects of blue light can be read here:

<http://www.darksky.org/assets/documents/Reports/IDA-Blue-Rich-Light-White-Paper.pdf>

Circadian Rhythm

The 24-hour day/night cycle, known as the circadian clock, affects physiologic processes in almost all organisms, including humans. These processes include brain wave patterns, hormone production (i.e. melatonin), and other biologic activities. Disruption of these rhythms can result in insomnia, depression, cancer, cardiovascular disease, and other health concerns. In 2012 the American Medical Association has recognized light at night as a carcinogen and a health risk. More information may be found at:

http://www.darksky.org/assets/documents/AMA_2012_report.pdf

Melatonin

Melatonin is a naturally occurring hormone that is released in darkness and inhibited by light. It serves many functions in the

human body, primarily regulating the daily cycles of our systemic activities. Reduction or elimination of light at night can help maintain a robust melatonin release. While any kind of light can interfere with melatonin production, the short wavelength, blue portion of the spectrum is the most potent for melatonin suppression in humans. This type of light (often found in electronic devices) should be avoided during the night.

Sleep disorders

Exposure to the artificially extended daytime of our lit, modern world can lead to desynchronization of our circadian rhythms. According to the National Institution of Health (NIH), a shift in our clocks impairs our ability to sleep and wake at the appropriate times and leads to a decrease in cognitive and motor skills. A good night's sleep helps reduce weight gain, stress, depression, and the onset of diabetes.

The NIH believes humans function best when they sleep at night and act in the daytime. If outdoor light is shining into your window and disrupting your sleep, it is recommended that you block out the light or request that the light be shielded for everyone's benefit.

Jim Richardson www.jimrichardsonphotography.com



Emerging Research

The scientific community is studying the range and complexity of circadian disruption and the role of melatonin suppression from too much artificial light at night. Scientists continue to find undisputed connections between sufficient sleep and good health. Moreover, they are recognizing the importance of exposure to daylight during the day and darkness at night to maintain a routine circadian rhythm. The World Health Organization now lists "shift-work that involves circadian disruption" as a probable carcinogen and the American Medical Association has recognized it as a carcinogen and health risk.

In addition to this, in 2009 and 2012 the American Medical Association adopted resolutions that support the reduction of light pollution and glare and advocate for use of energy efficient, fully shielded outdoor lighting. The American Medical Association has recognized light at night as a probable carcinogen. Ongoing research continues to probe the connection between natural darkness and human health.

Solutions

IDA believes that there are simple solutions to these issues:

- Shield and lower the wattage of all outdoor lighting.
- Use only the light you need to get the job done.
- Use timers, dimmers, and sensors to darken unoccupied areas. Shut off the lights when you can. Use warmer color temperature light sources when possible (i.e. red & orange).

- Keep your bedroom as dark as possible by using blackout curtains when sleeping, and remember, exposure to electronic media at night can disrupt sleep cycles.

A shielded light uses less wattage and saves everyone money, reduces our energy use, and shrinks our carbon footprint. Work with your neighbors and local government to keep the light on the ground and the skies natural. This is a win-win situation for everyone. You save money while preserving a valuable natural resource.