

Blue light against the blues

By ACSH Staff — February 22, 2012

A plethora of age-related health conditions might, in fact, be a question of declining vision, Laurie Tarkin [reports](#) [1] in this week's health and science section of *The New York Times*. Tarkin looks specifically at groundbreaking research by two ophthalmologists at the University of Kansas School of Medicine, as well as a researcher at Brown University. Their latest findings add to an increasing amount of evidence that certain chronic ailments may be due to aging of the lens in older people's eyes, which reduces the amount of blue-spectrum light that is absorbed by the retinal vision receptor cells. This in turn is thought to disrupt the body's circadian rhythm—the internal clock crucial for establishing sleep and wake patterns.

Memory loss, delayed reaction time, insomnia, depression even cancer and heart disease appear to be associated with how efficiently a person's sleep-wake cycle is operating. When the circadian rhythm is disrupted for a prolonged period of time, people develop a greater risk for these ailments. One of the most important stimuli of circadian rhythm is sunlight, which is absorbed by photoreceptive cells in the retina that then signal to the suprachiasmatic nucleus (SCN) a region of the brain that controls the internal clock. However, when the yellowing lens and narrowed pupil of an aging eye restricts the amount of sunlight absorbed by the retina, the body's internal clock is thrown out of whack.

Based on external cues, mainly sunlight, the SCN releases the hormone melatonin in the evening to induce sleep, and cortisol in the morning to aid in waking. But in people who experience an abnormal release of these hormones, their circadian rhythm becomes dysfunctional, which researchers have found is associated with a higher incidence of certain ailments.

One study focused on the eye's absorption of blue light, which is the part of the spectrum to which the retinal cells that signal to the SCN are most sensitive. This study found that the amount of blue light that reaches the retina in order to regulate the circadian rhythm decreases noticeably with age. In fact, by age 45, the University of Kansas researchers estimated that the eyes of the average adult receive just 50 percent of the light needed to fully stimulate the circadian system. By age 75, that amount dips to only 17 percent.

Although the medical community is probably a long way from establishing any sort of definitive guidelines for correcting an internal clock that's out of sync, experts in the field do have a few recommendations. Dr. Patricia Turner and Dr. Martin Mainster, the University of Kansas researchers, believe that aging people especially should make an effort to expose themselves either to bright sunlight or to bright indoor lighting.

Furthermore, Drs. Turner and Mainster question the common practice of implanting blue-blocking lenses when replacing the clouded lenses of those who undergo cataract surgery. The new lenses are intended to reduce the risk of macular degeneration by limiting exposure to damaging light yet as these researchers point out, while there's no good evidence that such patients are at higher risk

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Links

[1] <http://www.nytimes.com/2012/02/21/health/aging-of-eyes-is-blamed-in-circadian-rhythm-disturbances.html>