

Rebecca E. Hutchins, O.D., F.C.O.V.D.

### Losing Sleep? **Light** may be a Culprit!

We all learn as children how bears hibernate during the winter. How do they know when to do this? It is governed by the timing and intensity of light. Humans, too, are affected by so-called "circadian rhythms", which influence sleep-wake cycles, jet lag, attention and arousal, eating and drinking habits, and many aspects of metabolism.

Rods and cones are the photoreceptors we all learned about in school. In the beginning of the 21<sup>st</sup> century, a previously unknown photoreceptor, Melanopsin, was discovered. This photoreceptor transmits information to the pineal gland and is instrumental in controlling the production of melatonin.

Melanopsin is triggered by light, of a specific wavelength, which we perceive as blue (460-480 nanometers). Light, especially blue light, suppresses the production of melatonin, and thereby affects sleep.

So how does this affect us in our daily life? It means that if we are exposed to light during the night—try to sleep during the day, sleep with a bright night-light, have street lights or neighbor's lights that shine into our bedroom window, or are in an urban area that is never truly dark, get up during the night and read, watch TV or are on the computer, we will not have the expected triggering for our production of melatonin.

In fact, most researchers in this area believe, like James Phelps, a psychiatrist from Corvallis, Oregon, that we really need to be protected from blue light for at least 2 hours prior to sleep.

And, you may wonder, what in our environment are the two prime sources of blue light? You guessed it: computers and televisions. This means that watching TV or watching the computer right before bed, or during the night, or sleeping in a room with a TV or computer on, is actually bad for our ability to get good sleep.

Using night shift workers, researchers found that amber lenses, or other tints that block the blue wavelengths allow the person to work in light, yet produce melatonin as if in darkness. As Dr. Phelps puts it, "blue light is the light that counts" and blocking it can be one option.

If you have sleep issues and wonder if they are related, you may want to consider some of the following options:

- Eliminate use of computer and television 2 hours prior to bedtime
- Cover or hide light-emitting diode clocks and other devices
- Keep the bedroom uniformly dark during the night with light-blocking shades if there is outdoor light that comes in a window
- If a night-light is needed, consider one that is rated low blue light
- When it is not possible to eliminate computer or television use for the 2 hours prior to bed, consider the use of tinted lenses which block the appropriate wavelengths
- If using tinted lenses, choose a frame that blocks as much light from the side as possible
- Work to minimize or eliminate "light at night" pollution in your area