

# Good night lights need to be dim and below 3000 Kelvin

## Human health effects of Light At Night

By Dr. Gene Fioretti

Until the early 1980's Light at Night (LAN) was not considered to be bad for humans. Since then a large and ever increasing body of evidence has demonstrated its many detrimental effects. Because of their subtlety these effects are not obvious, but, once looked for, it may wholly or partially explain many human maladies. Although a direct cause-effect may be impossible to prove, the continued accumulation of scientific evidence behooves us to recognize its potential and act accordingly.

Human health is a remarkable balance of multiple factors. It cannot be denied that our present state is the result of billions of years of evolution always dominated by a day made up of half daylight and half night darkness. In keeping with this we developed circadian rhythms (Latin: around a day).

We mostly identify night with sleeping. Although we appear inactive, sleep is a very active time for the body. Without it we shortly cannot function or survive. Until the introduction of the electric light humans were usually active during the day and resting or sleeping at night with natural dim light from the stars, moon and amber light from fire. Now, suddenly, we are bathed in electronic LAN and our bodies think the day is longer. Our circadian rhythms have been thrown out of sync with the earth's cycle.

Important cellular activities are disrupted. Duration and quality of sleep is lessened resulting in daytime fatigue with diminished functionality and depressed mood. Internally, significant disruption of cellular function develops as our "clock" genes fail to produce their regulatory proteins potentially leading to diabetes and cancer. Nocturnal release of Melatonin is suppressed by LAN, so we don't get tired. But that's not all. The decreased beneficial effects of Melatonin that have been repeatedly shown experimentally may lead to the survival of breast and prostate cancer cells that otherwise may have been suppressed or killed by its actions. Other LAN triggered hormone imbalances lead to eating behavior changes that cause obesity and compound the diabetes risk.

The World Health Organization (WHO), declared light at night as experienced by nurses and shift workers as a cause of cancer equal to cigarettes. As our knowledge base increases, the research becomes more pointed. We are starting to single out certain wavelengths of light as most disruptive. Blue light has the biggest negative effect at this time.

The aging human eye is subject to a blinding effect from glare at night especially from blue light. Another elegant study has shown it is best to keep the blue light down for better overall visibility, even in fog, with less sharp shadows due to better dark adaptation, finally recommending 3000k(as opposed to 4000k) fixtures for street lights.

So we should keep our outdoor lights at a minimum necessary brightness, fully shielded and positioned properly to minimize glare, and avoid the blue spectrum, using no more than 3000k streetlights. We should minimize our indoor light pollution by using dim red night-lights and keeping stray outdoor light out of the bedroom, and avoiding bright and blue TV, tablet and smart phone light by turning down the intensity and using apps like flux for android/PC, and night shift for I-Phone/I-Pad, and avoiding bright lights for several hours before bed.

Dr. Gene Fioretti is a retired cardiologist after practicing at the Tucson Medical Center.