Lighting experts refute American Medical Association report on blue light

April 17, 2017

The American Medical Association's (AMA's) recent report, "Human and Environmental Effects of Light-emitting Diode (LED) Community Lighting," has ignited controversy in the lighting industry with its recommendations regarding blue light. At "Outdoor Lighting and the AMA," a panel at the National Lighting Bureau's (NLB's) Annual Lighting Forum, speakers Mark S. Lien, LC, CLEP, CLMC, HBDP, LEED AP (industry relations manager of the Illuminating Engineering Society [IES]), and Terry K. McGowan, FIES, LC (International Dark-sky Association [IDA] representative on NLB's board of directors), discussed the topic.

Professionals at the National Lighting Bureau (NLB) Annual Lighting Forum discussed the American Medical Association's (AMA's) new research report on the health effects of blue light, examining where it falls short and what dangers it may pose.
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According to McGowan, it is true excessive exposure to blue light through LEDs can pose health problems, as it suppresses melatonin production, which in turn interferes with circadian rhythm and sleep/wake cycles. However, this is not the case for all types of blue light, and making recommendations based on the wrong blue-light metric—as AMA did in its report—can spread significant misinformation. In his criticism, Lien states the AMA report did not even provide a definition of 'blue light.'

The metric used by AMA to determine which sources emit blue light is chromaticity, or correlated color temperature (CCT). This measures the visual color or color temperature of the light using degrees Kelvin (K), but provides no indication regarding the melanopic content of the light, despite the fact this content is what has the capacity to suppress melatonin. In other words, even if many different light sources are all rated 3000K—the AMA-recommended chromaticity for outdoor lighting—there is no guarantee they will produce the same or even similar amounts of melanopic content.

McGowan also says the AMA report overlooks the 'dose' of blue light. Depending on when and how much blue light reaches the eye, he argues, the results can be different—for instance, our bodies 'expect' high levels of specific blue-light wavelengths in the morning to help reset the circadian clock.

"The light dose has to do with the overall amount of light energy that reaches the eye," says McGowan. "It depends upon the intensity of the light, its spectral composition, the duration, and even when that dose is given—such as morning or evening. You can't simplify that and say, 'Just because a light source is blue or indicates blue wavelengths, it's harmful.' You have to know how much and when those blue wavelengths reach the eye to know how much they are going to affect that person."

What does this mean for design and construction professionals? Primarily, it is a critical consideration for outdoor lighting programs—basing design decisions on misinformation about the effects of blue light and how to measure it can lead to dangerous conditions.

Randy Reid, editor and publisher of *EdisonReport* and the panel's moderator, stated some cities responded to the report by halting outdoor relighting programs or implementing changes to move to the recommended CCT. Lien says this "is where we have the greatest issue. We have data that show that 4100K provides roadway lighting that results in up to 20 percent greater visual acuity than 3000K."

In other words, using the wrong metric to determine what type of blue light to use can cause professionals to make decisions that not only fail to provide significant health benefits, but also reduce roadway visibility and drive up energy costs.

"Given the media attention that the AMA report received, we can assume that many public- and private-sector outdoor lighting system designers and owners are following the AMA recommendation as a means to reduce their negligence-liability exposures, without realizing they may actually be increasing them," says John Bachner, NLB's executive director.

For further illumination, a video of the panel discussion can be viewed below.

Outdoor Lighting & the AMA

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