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The Endocrine Society

Room light before bedtime may impact sleep quality, blood pressure and diabetes risk

New study shows indoor lighting has profound suppressive effect on the hormone melatonin

Chevy Chase, MD—According to a recent study accepted for publication in The Endocrine Society's *Journal of Clinical Endocrinology & Metabolism* (*JCEM*), exposure to electrical light between dusk and bedtime strongly suppresses melatonin levels and may impact physiologic processes regulated by melatonin signaling, such as sleepiness, thermoregulation, blood pressure and glucose homeostasis. Melatonin is a hormone produced at night by the pineal gland in the brain. In addition to its role in regulating the sleep-wake cycle, melatonin has been shown to lower blood pressure and body temperature and has also been explored as a treatment option for insomnia, hypertension and cancer. In modern society, people are routinely exposed to electrical lighting during evening hours to partake in work, recreational and social activities. This study sought to understand whether exposure to room light in the late evening may inhibit melatonin production.

"On a daily basis, millions of people choose to keep the lights on prior to bedtime and during the usual hours of sleep," said Joshua Gooley, PhD, of Brigham and Women's Hospital and Harvard Medical School in Boston, Mass. and lead author of the study. "Our study shows that this exposure to indoor light has a strong suppressive effect on the hormone melatonin. This could, in turn, have effects on sleep quality and the body's ability to regulate body temperature, blood pressure and glucose levels."

In this study, researchers evaluated 116 healthy volunteers aged 18-30 years who were exposed to room light or dim light in the eight hours preceding bedtime for five consecutive days. An intravenous catheter

was inserted into the forearms of study participants for continuous collection of blood plasma every 30-60 minutes for melatonin measurements. Results showed exposure to room light before bedtime shortened melatonin duration by about 90 minutes when compared to dim light exposure. Furthermore, exposure to room light during the usual hours of sleep suppressed melatonin by greater than 50 percent.

"Given that chronic light suppression of melatonin has been hypothesized to increase relative risk for some types of cancer and that melatonin receptor genes have been linked to type 2 diabetes, our findings could have important health implications for shift workers who are exposed to indoor light at night over the course of many years," said Gooley. "Further research is still needed to both substantiate melatonin suppression as a significant risk factor for breast cancer and determine the mechanisms by which melatonin regulates glucose metabolism."

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Other researchers working on the study include: Kyle Chamberlain of the University of Surrey in the United Kingdom; and Kurt Smith, Sat Bir Khalsa, Shantha Rajaratnam, Eliza Van Reen, Jamie Zeitzer, Charles Czeisler and Steven Lockley of Brigham and Women's Hospital and Harvard Medical School in Boston, Mass.

The article, "Exposure to room light prior to bedtime suppresses melatonin onset and shortens melatonin duration in humans," appears in the March 2011 issue of *JCEM*.

Founded in 1916, The Endocrine Society is the world's oldest, largest and most active organization devoted to research on hormones and the clinical practice of endocrinology. Today, The Endocrine Society's membership consists of over 14,000 scientists, physicians, educators, nurses and students in more than 100 countries. Society members represent all basic, applied and clinical interests in endocrinology. The Endocrine Society is based in Chevy Chase, Maryland. To learn more about the Society and the field of endocrinology, visit our site at www.endo-society.org.